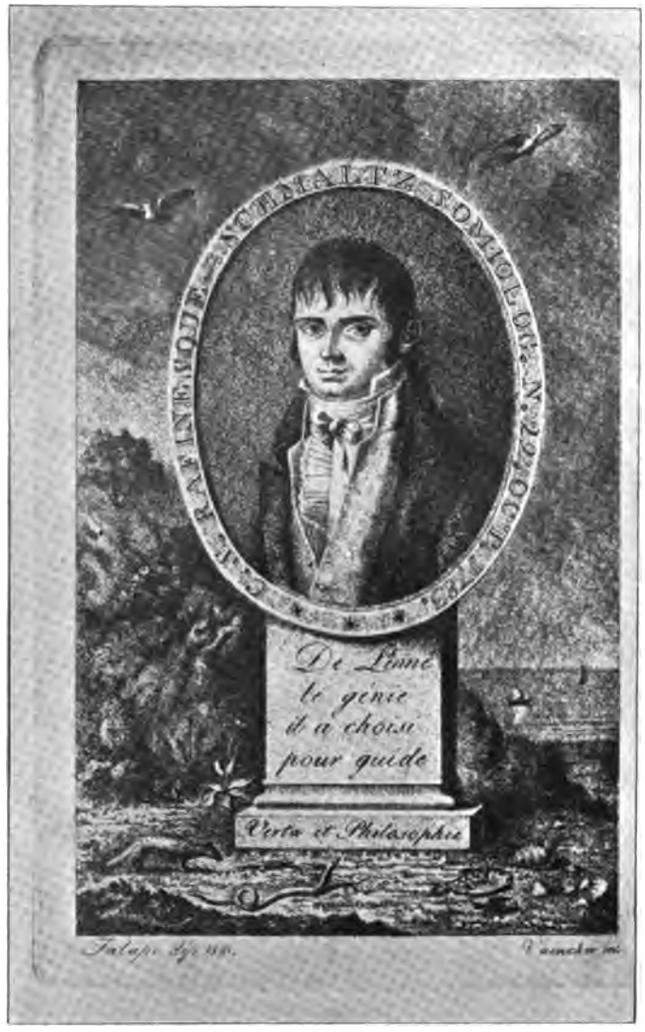
Filson Club Publications

NUMBER TEN

THE LIFE AND WRITINGS OF RAFINESQUE

By

Richard Ellsworth Call, M.A., M.Sc., M.D.



FROM THE "ANALYSE DE LA NATURE."

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FILSON CLUB PUBLICATIONS NO. 10

THE LIFE AND WRITINGS

OF

RAFINESQUE

Prepared for the Filson Club and read at its Meeting
Monday, April 2, 1894

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Member of the Filson Club

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TO THE MEMORY OF

Constantine Samuel Rafinesque

NATURALIST

PREFACE.

THIS memoir had its inception in an attempt to clear up certain matters connected with the synonymy of a large and important group of fresh-water mollusks—the *Unionidæ*. A number of very remarkable facts connected with the personality of its subject were thus incidentally learned. As the collation of data proceeded the facts gathered seemed of sufficient importance to group them for presentation to the literary and scientific world, in the hope that a better and more intelligent understanding of this eccentric naturalist might result. A number of impressions were forced upon my attention as the work proceeded; among other conclusions reached was the one that Rafinesque had not been treated always fairly by his contemporaries. Resulting from this was the conviction that many naturalists now living have formed opinions concerning the nature and value of Rafinesque's work, which appear to me to be quite erroneous. In the hope that some of these misapprehensions might be corrected the task of writing his life, which is quite a labor of love, was undertaken.

The Filson Club, an organization devoted primarily to the collection and preservation of original matter connected with the history of the State of Kentucky, has, since it recognizes Rafinesque as the first resident professor-naturalist within the limits of the State, been particularly interested in this memoir, and its aid has been freely extended in the matter of sumptuous publication. The intelligent interest and historical enthusiasm of Colonel R. T. Durrett, LL. D., the President of the Club, was early enlisted in the project, partly for the reasons above given and partly because of personal interest in the career of a most remarkable man. He freely offered access to his superb and unrivaled library of *Kentuckiana*, without which courtesy much, which now appears, must long have remained unknown.

During the progress of this work numerous courtesies have been extended, and by various persons. To these especial thanks are due. Professor Howard M. Ballou, of the Louisville Manual Training High School, spent many days in the various libraries of Boston and Cambridge in abstracting and verifying certain bibliographic matter; to his interest and zeal this portion of the brochure owes very much indeed; he has also rendered invaluable aid in proof-reading as the several signatures came from the press. Doctor G. Brown Goode, Assistant

Director of the United States National Museum, Doctor Charles S. Sargent, Director of the Arnold Arboretum at Jamaica Plains, Mr. C. E. Faxon, of the same institution, Honorable Thomas Meehan, of Philadelphia, and W. H. Venable, LL. D., of Cincinnati, have all contributed valuable aid. Doctor Goode especially has courteously furnished all the references to the rare *Specchio delle Scienze*, and has also verified others; he further has looked over the proofs of part of the bibliographic portion as they came from the printer, and has made numerous valuable suggestions. I desire to make especial mention of the aid afforded by Miss Johanna Peter, of Lexington, who kindly undertook the laborious task of a careful search through the Lexington Library, rich in old Kentucky books and newspaper files, and thus led to the discovery of many useful items. Mr. Alexander Griswold kindly photographed the pages for the plate illustrating the *Florula Ludoviciana;* Doctor William T. Durrett did the same with the page for the plate from the Fishes of the River Ohio. Mrs. Asa Gray has courteously allowed the use of the letter to De Candolle, from among the letters left by Doctor Asa Gray, which is herein reproduced. To Doctor B. L. Robinson, Curator of the Herbarium at Harvard University, thanks are due for the opportunity to photograph the portrait

of Rafinesque, which forms the frontispiece in the "Analyse de la Nature," and which subserves the same purpose in this volume. To all these gentlemen and other helpers most cordial thanks are extended.

Several important items connected with rare books were searched for and given me by Mr. Sidney M. Ballou, of Harvard University, for which grateful acknowledgment is tendered. The portrait of Rafinesque, from the Wisconsin Historical Society, was permitted presentation through the generous courtesy of Honorable R. G. Thwaites, the Secretary. To our publishers especial acknowledgments are due for the pains taken to secure perfection in the sumptuous form of publication adopted. Their work needs no commendation.

To the naturalists of America this brochure is submitted in the hope that it will at least aid in placing its remarkable subject in his proper place in the history of natural science in this country. Whether all will acquiesce in the conclusions reached is really a matter of very small moment. If there shall result an intelligent estimate, favorable or otherwise, of the writings and botanical or other scientific work of Rafinesque; if those who have known him only through misinformation furnished by contemporaries, who, in all cases, were not wholly disinterested investigators, shall now have oppor-

tunity to consult his published work, and shall be able, through it, to approve or condemn his course; if the tendency to ignore all of his work because some of it was peculiarly bad shall give way to a more generous treatment, then, the time required to collect and arrange the scattered matter which constitutes the bibliographic portion of this volume, and to present for inspection the whole course of an active though largely misdirected life, will be amply repaid. It is not true, notwithstanding that the editor of a well-known scientific journal has but just editorially so declared, that recent identifications of Rafinesque's species "will be ultimately set aside, when a more critical spirit prevails among species zoölogists"; on the contrary, outside of certain editorial rooms there prevails that spirit of honor and fairness which demands that these claims shall be recognized. The position thus editorially assumed is, in itself, a complete justification for the expenditure of the time and means involved in presenting, to men of science, this *resumé* of the work and life of Rafinesque.

RICHARD ELLSWORTH CALL.

THE FILSON CLUB,
LOUISVILLE, KENTUCKY,
7 JANUARY, 1895.

ANALYSIS.

THE LIFE AND WRITINGS

OF

Constantine Samuel Rafinesque.

THE difficulties with which students of science meet, especially when far removed from the great centers of scientific learning and culture, are often not appreciated at their full value. Familiarity with the work of others in the same fields is impossible to many; sympathetic interest on the part of others is unknown; fruitful methods which result from the successful experience of others are unheard of; means of publication of facts of value and of especial scientific importance on first discovery are entirely wanting. Then, too, it often happens that communities which are far removed from the great urban centers have little appreciation of the life and work of the student of Nature, who is always open to the suspicion of mental derangement, or at least of being charitably regarded as "eccentric". Far more noticeable is this unfavorable feature in a country yet quite primitive. In such regions the indus-

tries and minds of the people are concentrated upon the single problem of making the unwilling earth yield an abundant store, or else directed to that other task of reclaiming a virgin forest and establishing a center of urban life and activity. Mental and scientific pursuits under these conditions receive little attention and less encouragement; in some unexplained manner it often happens that those who attempt to promote these objects meet with decided opposition. Such opposition is based chiefly upon the idea that matters of any sort, to be of value, must have reference solely to the real present and find expression in money values. Rare indeed is it, in these early communities, to find any adequate conception of the value of the work and time spent in the collection of plants and animals, of bugs and of fishes, of fossils and of clams. What matters it that one should know the life history of a single nocuous insect, or that he have full knowledge of the ways best to protect fishes in maintaining their existence in our streams? Is not a bug, a bug, and a gar-pike, a gar-pike, for all that? So say they all! And stranger still, let such matters become subject for legislative appropriations, and those who most directly are concerned stand in armed neutrality or else in aggressive opposition. Such is the common fate of propositions connected with

the development of natural resources when the State is asked to aid.

It follows from these considerations that one can not give a just estimate of the life and work of a man unless one regards well the times in which he lived, the prevailing enthusiasms or their lack, the public knowledge on matters of this sort, the public appreciation of their value, and the other conditions of social and educational environment of which the scholar and student of men, or of language, or of Nature, is not wholly independent. The beginnings of scientific life in Kentucky were in just such surroundings as these pictured, and long remained unchanged. In such primitive scenes, though trained in an old and cultured community, the most active period of a most eventful life was passed; in estimating its value to us and to the State all these facts must have weight.

Birth and Early Life.

Constantine Samuel Rafinesque [Schmaltz] was born in Turkey in Europe, in Galata, a suburb of Constantinople, October 22, 1783. He was of French-German descent, his father being a French merchant of Marseilles, while his mother,* though born in Greece, was

*Died at Bordeaux, 1831.

of German parentage, from Saxony. The mercantile enterprises of his father reached to distant lands and often necessitated his absence from home for long periods at a time. There would seem to be but little question but that matters connected with his father's business ventures and their recital in the home of the lad had something to do with determining his future bent toward travel. The family was not a large one; Rafinesque had one only sister, who became a Mrs. G. Lanthois, of Bordeaux, whose name was never mentioned by our author save once, and a younger brother, Anthony Augustus. From the circumstance that Rafinesque speaks of this brother as his younger brother some have inferred that there was an older member of the group of sons, but if so it nowhere appears in any of his writings. More of the family is not known. The younger brother drops out of the record after 1805, having gone to France from Philadelphia, and thence to Sicily, and nothing further is known of him. Of the mother very little is known, but from the fragmentary items connected with the earlier education of Rafinesque it would appear that she was a most intelligent woman, and had great concern for the proper education of this son. The absence from home of the father naturally placed almost the entire care of this phase of the

boy's home life in his mother's hands, and she seems to have performed her duty well and conscientiously.

Rafinesque says* that in one of the numerous country seats about Marseilles he first became conscious of his existence, and there he received his first education. In his own words: "It was there among the flowers and fruits that I began to enjoy life, and I became a Botanist. Afterwards the first premium I received in a school was a book on Animals, and I became a Zoologist and Naturalist." There are some who profess to see in this statement that Rafinesque had too high an appreciation of his powers, since a young man, or, rather, a mere boy, such as he then was, could have been neither a botanist nor a zoölogist. Perhaps, however, the just interpretation will be the one Rafinesque himself intended, namely, that these books determined his career and that he dated his interest in scientific matters from that time. In 1793 his father died, a victim to the yellow-fever epidemic of that year which made such waste of life in Philadelphia, whither the merchant Rafinesque had gone to escape the English cruisers. The recollection of this fact afterward cost the son much trouble in a similar epidemic which obtained in Philadelphia, after Constantine had himself become a resident of that city.

*A Life of Travels and Researches in North America and South Europe, etc., p. 6.

The four years from 1792 to 1796 were passed in residence with his mother near Leghorn, in Italy, whither she had gone through fear connected with the excesses of the French Revolution. He had previously been taken to several other places by his parents, and this fact, coupled with his later travels, gives the *raison d'être* of the French couplet which graces the title page of his "Life." It reads:

> "*Un voyageur des le berceau,*
> *Je le serais jusqu' au tombeau. . . .*"

During his residence in Italy his education was directed by private teachers, and geometry, geography, history, drawing and the English language engaged his attention. He developed a taste for reading, and found the greatest pleasure in books of travel, greedily devouring them all. He declares, probably in hyperbole, "Before twelve years of age I had read the great Universal history and one thousand volumes of books on many pleasing or interesting subjects." It was while he dwelt at Leghorn that he began regular herborizations, in 1795, and commenced the formation of a herbal. From what he himself relates it would appear that during this period he was allowed the fullest liberty and gave full bent to his whims or wishes, and read and studied what he pleased. He congratulates himself that

he had wasted no time on dead languages, "but had spent it in learning alone and by mere reading ten times more than is taught in the Schools."

In 1796 Rafinesque was taken to Genoa, and the journal of this tour constituted his first essay of the kind. In making mention of this journal he remarks that he had done the same ever since by notes or journals. His residence varied for the next few years between Genoa, Pisa, and Marseilles, during which period his training was successively in the care of his mother and grandmother, but was completed by himself. During these years also he continued his botanical studies and "read every kind of books, good or bad; but happily I knew how to distinguish them." To his studies he now added natural and moral philosophy, chemistry, and medicine. It is not to be understood, I take it, from these remarks of Rafinesque about the direction assumed by his student-work at this time that he means to imply he had mastered these branches. He was an indefatigable reader and no doubt read every thing in the way of books that came to hand, and books on these subjects were among the number. In a curious and naïve way he tells us about his nature studies in the neighborhood of Marseilles, where his botanical walks gave him much pleasure. He appears first of all to have devoted him-

self to the study of plants, but also gave much attention to other branches of natural history. He says:

"I had made to myself a small garden in a wild and remote place. I began the study of Fishes and Birds, I drew them and collected Shells and Crabs. Daudin, of Paris, who published then a natural history of Birds, was my first correspondent among the learned, and I communicated to him some observations on Birds. I drew maps, copied those of rare works, and took topographical surveys; these were my first essays in geography."

In reading Rafinesque's account of a hunting episode which took place near Leghorn in 1802, one will be struck with the similarity of his experiences and those recorded by Charles Darwin, England's great naturalist.* Rafinesque says: "I began to hunt, but the first bird I shot was a poor *Parus*, whose death appeared a cruelty to me, and I have never been able to become an unfeeling hunter." Darwin had the same feeling for animals, even the very lowest, and never allowed himself to harm them wilfully or knowingly.

The year 1802 marked, in the spring, the end of the youthful home life of Rafinesque. There appears in the record no evidences of interest in matters which should prove attractive to a boy of his years. Whether he ever had any fondness for boyish sports and games,

* *Vide* Life and Letters of Charles Darwin, Vol. I, p. 28, 1887. D. Appleton & Co., New York.

whether he had much enjoyment in the association with other youths, whether these facts had not great influence in determining his attitude toward social events in after years can all be but matter of conjecture. In recounting the facts connected with his early life Rafinesque omits very many important things which we should enjoy knowing, but enough is told us to explain the system or rather the lack of system in his studies. Perhaps this will explain the apparent want of those closer habits of application which characterize the best work of men of science. The record simply discloses that he essayed every branch of natural science, read omnivorously, made copious notes, formed ideas which were often vague and never afterward matured, and always had before him the travels and work of the great men of his own and preceding decades; it appears, too, that he fondly imagined himself about to become, or that he had already become, a great traveler. It is really believed that this period of great mental activity and developing powers of observation, for such it certainly was, had he been firmly guided by some master hand, would have given the world one of its greatest naturalists. But the lack of coördination of powers led to habits, both of thought and literary effort, that had a serious influence, in after years, on his life and work.

First Visit to America.

Rafinesque first came to the United States, in company with his younger brother, Anthony Augustus, in the spring of 1802, "provided with an adventure and many letters of introduction". He landed in Philadelphia April 18th. With a mind keenly awake to natural objects it is not surprising that at once he again began the study of Nature, probably with fresh ardor born of new surroundings and a novel flora. Scarcely had he landed in his new home before he began botanizing, and found a cruciferous plant which had passed under the name of *Draba verna;* he considered it new and bestowed upon it the name of *Draba americana.* Whether a formal description of this plant was ever written by Rafinesque I know not; it is not mentioned in Watson's "Bibliographical Index to North American Botany", which contains many other names formulated by Rafinesque, so it is to be presumed that he never presented it in such form. But he remarks of this species that "the American Botanists would not believe me; but Decandole has even since made with it the new Genus *Erophila!** This is the emblem of many

*Watson, *loc. cit.*, p. 62, regards both the genus and species of DeCandolle as synonyms, and retains the name of *Draba verna.*

discoveries of mine of which ignorance has doubted, till science has proved that I was right." To us, at this time, the interesting fact connected with the finding of this specimen and supposed new species lies in the evidence which it affords that Rafinesque was forever wedded to his loves, the flowers. Here he was, at the age of eighteen, in a new land, on fortune bent, in the midst of strangers who spoke a strange tongue, yet he at once turned to the woods and fields, a real student of Nature, and averse to any thing else.

The Philadelphia business relations of Rafinesque were those which eventually determined his coming to Kentucky some eighteen years afterward. While in that city he came into relation with the Cliffords, owners of the vessel which brought him to America; also here he met the brothers Tarascon, formerly of Marseilles, whose names are familiar to all students of early Kentucky history. At this time Rafinesque was busied with mercantile pursuits, occupying a clerkship, but filled all his leisure with botanizing in the vicinity of Philadelphia. He declares that during this period he minutely described all the plants found, a task quite characteristic of the man! He had already determined upon following the footsteps of his father, and devoted himself to mercantile pursuits, prosecuting his Nature studies in

hours of leisure, but withal with serious intent. But now came again the yellow fever, in the summer of 1802, of which Rafinesque writes: "Being much afraid of this disorder, which had deprived me of a father, I left the city and took refuge in Germantown; where I had the good luck to be invited by Col. Forrest, a Friend of Horticulture, to dwell with him, and travel with him to collect Plants." This gave him a summer of travel and botany, for the scourge which he sought to escape did not disappear until the following October. A considerable number of excursions about Germantown, some of which extended into New Jersey and over Eastern Pennsylvania, were made during this period. While these were nothing more than botanical tramps, such as the veriest tyro is compelled to take who desires an acquaintance with the flora of any locality, Rafinesque dignifies them by the name of "journies"; in this peculiarity he shows in a remarkable manner the influence of his early reading. If not yet such, he surely would be a veritable Marco Polo or von Humboldt!

During this stay in Philadelphia Rafinesque had frequent opportunity to visit the botanical gardens of Marshall and Bartram, the former of which was not far away at West Chester. Attention will again be directed to these gardens in connection with a certain

experience of Rafinesque at Lexington, in Kentucky, years afterward; the reader will then remember that all about Marseilles, where Rafinesque had spent much of his boyhood life, are to be found botanical gardens in which he must often have been as student and collector.

But the summer spent in plant-hunting and other scientific work, very congenial to the disposition of Rafinesque, had unfavorably disposed him toward a business life. The irksome quiet of the office had been relieved by a summer with the birds and flowers, and to his duties he returned with laggard feet. Not only did he not like the close confinement incident to a clerkship, but it may even be supposed that the emoluments of such a position in that early day were certainly not in excess of those of the present time; surely in such career those ever present dreams of wide travel and learned books could never become fact.

In 1804 Rafinesque resigned his position in favor of his brother, of whom he makes no other mention for all this time, and became secretary to a gentleman by the name of Gernon. This position was also abandoned early in the spring of the following year; the place was one "of no advantage", and then he could not withstand the allurements of the forests and fields. His whole time was now given to the collection of the plants and

animals about the city, and also of those of the neighboring States. He extended his tours into Maryland, Virginia, and Delaware, for he had already foreseen that it was but a question of short time until he should leave America. He made the most of his opportunities and gathered large numbers of all things collectible. Thus passed the period until January, 1805, when both he and his brother,* "who would follow" him, set sail for Italy. In May he became a resident of Sicily.

TEN YEARS IN SICILY.

"This lovely Island" was reached after a delightful voyage, its presence having been foretold "by the emanations of orange blossoms, carried far at sea in the night by the land breeze." Says he, further, "The mountains were smiling with flowers and verdure, they invited me to climb over them." He was now twenty-two years of age, enthusiastic, energetic, habitually careless both of his person and his methods of study, and about to enter upon a scientific career of the greatest moment. Here he began that extensive series of publications, record of which has been attempted in the accompanying bibliography.

*This brother died at Havre, 1826.

It is materially unfortunate, to our mind, that Rafinesque does not, in his "Life of Travels", enter somewhat more into detail respecting his home life in Sicily. But one will search in vain for a single word on these topics. There seems to have been abundant reason for not mentioning these matters, for Rafinesque married, in 1809, a Sicilian woman by the name of Josephine Vaccaro, a woman who does not appear to have been suited to the kind of life the naturalist had marked out for himself. It is more than probable that this marriage was never consummated in legal form. In his will,* from which alone this information is obtained, he says: "While residing in Sicily I deemed myself lawfully married . . . although the decree of the Council of Trent forbade our regular marriage." The two inferences which may safely be drawn from this statement are, first, that the Sicilian whom he espoused was a Roman Catholic in religious faith, and, second, that legal or religious rites were never solemnized. In 1811 a daughter, Emily, was born to the couple, and in 1814 a son, Charles Linnæus. The boy died the following year, 1815. Neither child is mentioned by Rafinesque in all his writings; in his will alone we find the first intimation of paternity and of parental solicitude. Of the

Vide* **Appendix, where this will is given in full.

daughter no information other than that which is given in this document has been attainable. The consort of Rafinesque, on receiving the news of his shipwreck in 1815, "suddenly married Giovanni Pizzalour, a comedian," and dissipated the property which Rafinesque had left in her hands. All that is further known of this woman is the opinion in which she was held by Rafinesque, who, in his will, declares her to be "unworthy", and directs that his executors shall not allow her "a single cent"; he also directs that no part of his property should be paid to his daughter Emily "until she leaves altogether and separates from" her mother.

Emily, influenced no doubt by the theatrical relations of the new family bonds, became a singer in the Palermo Theatre. She was the mother of an illegitimate daughter, Henrietta Winston, by one Sir Henry Winston, for the maintenance of which grand-daughter Rafinesque was not certain the baronet would provide; he therefore commends her, in his will, to his nephew, Jules Rafinesque. The last known of Emily was the simple fact of residence in Naples in 1833.

With this period of Rafinesque's career there is little of direct interest to us. First and all the time he was a naturalist; though his real concerns here were of a business character. It would appear, from his account

of these years, that he was reasonably successful in business enterprises, for he states that "by trading in the products of the island" he made his first personal fortune. It is curious to note that some of his ventures were along the line of economic botany, for his trade lay in the manufacture of squills for the European and American markets. Rafinesque first taught the Sicilians many things of this sort, thus proving himself, though unwillingly, another Latinus to this beautiful island. He became quite familiar with the whole island, and seems to have devoted himself assiduously to the study of every form of life within its area. All the ten years he spent here were full of toil and study. They were, on the whole, very happily passed, though many of his business employments were heterogeneous and peculiar. At one time connected with the United States legation as secretary or chancellor to Minister Gibbs, at another the manager of a successful brandy-still for a company of gentlemen, next a candidate for a State position which he never obtained, editor of a magazine, naturalist and collector always, these were the occupations with which he filled the ten years of Sicilian life. He became personally and by correspondence known to many of the scientific men of Europe, and with some of them he had very pleasant relations. Swainson, the English nat-

uralist, was stationed for some time in Sicily, and with him Rafinesque had the most intimate and cordial coöperation. They collected and studied and wrote together. On one occasion, when the vicissitudes of business prevented personal attention on the part of Rafinesque, Swainson supervised the printing, at Messina, of one of his friend's books, "The Index of Sicilian Ichthyology". During these years, too, the habit of mind engendered by indiscriminate reading and delving into every thing natural bore its proper fruit; for a time he worked at volcanic rocks and eruptions, anon found recreation and employment in tracing the remains of ancient settlements, hunted plants, drew and described them, collected fish, secured large numbers of shells, assisted Swainson in hunting insects, worked on the reptiles, and withal kept up a voluminous correspondence with other naturalists in France, in America, and in Italy. In truth these ten years were very busy ones, an estimate of the work of which is offered in its proper place. His experiences with the natives of his chosen home do not appear to have been of the most pleasant character. In his description of Sicily occurs almost the only epigrammatic writing I have ever noted in Rafinesque's works; says he, "she offers . . . a fruitful soil, a delightful climate, excellent productions, perfidious men, deceitful women."

Second Visit to the United States.

In 1815 Rafinesque left Sicily and Europe forever. During the later years of his Sicilian residence, affairs, from a business and literary standpoint, had not progressed satisfactorily; he apparently did not regret the fact of leaving that famous island. The voyage began in July and ended in November. Adverse weather conditions met the vessel as soon as the Mediterranean was cleared; the good ship suffered the ordeal of a severe Atlantic storm, was damaged and compelled to seek a haven in the Azores. The Island of St. Michael thus by an accident became an object of botanical interest to Rafinesque. He collected thereon, observed the volcanic rocks, drew some of the objects found, and so turned a seeming misfortune to the best account possible.

The story of the landing of Rafinesque in America for the second time reads like a romance, and though there are many who profess to doubt its exact truthfulness I must confess to the most complete credulity in its essential correctness. I have so long read and studied this man, am so familiar with his character, which was open and honest, have so great an admiration for that part of his life which was unclouded by mental misfor-

tune that I will, I am sure, be pardoned for expressing thus strongly my belief in the truth of the story of shipwreck. It appears to me that the incident is extremely important in weighing certain facts of his after life.

It was midnight of the second of November, 1815, in a dense fog, on Race Rock, off Fisher's Island, at the eastern end of Long Island Sound, that the good ship, which had brought Rafinesque and his possessions across the Atlantic in safety, went down. Striking on the rocks, her keel was entirely torn away, and when a swell landed her beyond the rocks she rapidly filled and sank. Down with her went the results of years of toil and of labor, both mercantile and scientific. To quote the language of the sufferer:

> "I had lost everything, my fortune, my share of the cargo, my collections and labours for 20 years past, my books, my manuscripts, my drawings, even my clothes . . . all that I possessed except some scattered funds and the Insurance ordered in England for one third of the value of my goods."*

I can imagine the condition of this man under these circumstances. I can see him walking the streets of New London "in a state of utter despair". Here, in this misfortune, and resulting from it, began that mental

**Vide* "A Life of Travels", etc., pp. 48, 49.

condition which made his scientific work in later years subject of the severest criticism. He was still a young man, it is true, having seen but thirty-two summers, but those who have studied character will agree that this misfortune affected him as it might but one in a thousand. Of this loss he writes as follows:

"Some hearts of stone have since dared to doubt of these facts or rejoice at my losses! Yes, I have found men, vile enough to laugh without shame at my misfortune, instead of condoling with me! But I have met also with friends who have deplored my loss, and helped me in need."

Rafinesque appears never again to have known prosperous business adventures. He belonged to that large class of men, from this time, who imagine that the hand of every other man is against them.

Leaving New London, Rafinesque went to New York, where, pending the settlement of his insurance claims in London, he found warm friends. With Dr. Samuel L. Mitchill, with whom he had enjoyed a correspondence while yet a resident of Sicily, and to whom he had sent numerous scientific, chiefly botanical, papers, he found friendly greeting and a helpful friendship. The necessities of making a livelihood led him to accept the position of private tutor in a wealthy family by the name of Livingston, residing on the Hudson; therein

he taught Italian, drawing, and botany. It is more than likely that the introduction which Mitchill gave Rafinesque to New York literary society helped him to this place. But before spring he resigned this post because the family desired to spend the winter in the South. He again became a child of fortune. As soon as spring had sufficiently advanced he devoted his time to geology and to the collection of the plants which grew about New York. The summer following he went as far north as Saratoga, and spent several weeks at the series of falls which are so famous in East-central New York. In a similar manner was passed the long period of the four following years. Then he went to Philadelphia, on business bent, and again met his old friend John D. Clifford, known to all students of Kentucky history, who was and had been for some time a resident of Lexington. In him he found a warm and sympathizing friend, and was persuaded to visit the West, which then meant Kentucky.

The summer of 1818 finds the monotony of Rafinesque's life varied by a journey over the Alleghanies and down the Ohio, which he descended from Pittsburg in a flat-boat. He was one of a party of several men, who traveled by day and rested by night. This must have suited the taste of Rafinesque, who could thus give the

greatest possible attention to his loves, the flowers and the fishes and the mollusks. During his long residence in Sicily he had done much work on the fishes of the Mediterranean, and no doubt he found ample opportunity in the long days of slow movement down the Ohio to arouse again his intelligent love of these forms.

First Visit to the Falls of the Ohio.

The party with which Rafinesque reached Louisville found its haven at the Falls. At Shippingport* he was "received with open arms" by the Messrs. Tarascon, formerly of Marseilles and next of Philadelphia, who now operated a large flouring-mill at that place. For two weeks he remained there, and one who has ever seen the rich molluscan life of the Falls of the Ohio at low water might understand what busy weeks these were. Rafinesque spent the time "studying the fishes and shells of the river, of which I made a large collection, drawing them on the spot at the same time. I was surprized to find them nearly all new: this rendered my researches still more important and interesting."

*Shippingport is now within the corporate limits of the city of Louisville, at the foot of the Falls of the Ohio.

THE VISIT TO HENDERSON.

Extensive botanical and other collections were made by Rafinesque all the way from Louisville to Henderson; the trip being made by day, that he might better study the plants and fishes and shells. Arrived at Henderson he sought John J. Audubon, the ornithologist, to whom he had a note of introduction and with whom he remained several days. Rafinesque says "some days"; Audubon himself says "three weeks".

In this connection, perhaps better than in any other, reference may be made to an episode which Audubon has recorded of Rafinesque. With some reluctance, in this place, is the incident again related, not because it will have harmful effect in judging the work of Rafinesque, but because it must needs detract much from the fame of Audubon, whose reputation for strict truthfulness was never of the best among those who knew him. It serves to explain some features of the great ornithologist's life and strengthens the unfavorable opinion which some entertain of him; it serves also to throw light upon the plain, straight-forward, trusting character of Rafinesque. When the story is read between the lines the effect on the reader would appear to be most favorable to the victim.

Audubon introduces Rafinesque as the "Eccentric Naturalist",* the humor of which has so appealed to very many writers that they have been constrained to reproduce the episode without much interest in the man it most affects. Audubon nowhere gives the name of his victim, but it is understood that the "M. de T." is none other than Rafinesque. The account runs as follows:

"'What an odd-looking fellow!' said I to myself, as, while walking by the river, I observed a man landing from a boat, with what I thought a bundle of dried clover on his back. 'How the boatmen stare at him! Surely he must be an original!' He ascended with rapid step, and, approaching me, asked if I could point out the house in which Mr. Audubon resided? 'Why, I am the man,' said I, 'and will gladly lead you to my dwelling.' The traveller rubbed his hands together with delight, and drawing a letter from his pocket handed it to me without any remark. I broke the seal and read as follows: 'My Dear Audubon — I send you an odd fish, which you may prove to be undescribed, and hope you will do so in your next letter. Believe me always your friend, B.'

"With all the simplicity of a woodsman, I asked the bearer where the odd fish was; when M. de T. . . . smiled, rubbed his eyes, and with the greatest good humor said, 'I am that odd fish, I presume, Mr. Audubon.' I felt confounded and blushed, but contrived to stammer an apology.

"We soon reached the house, when I presented my learned guest to my family, and was ordering a servant to go to the boat for M. de T.'s luggage, when he told me he had none but what he brought on his back. He then loosened the pack of weeds which

**Vide* Ornithological Biography, Vol. I, pp. 455-460.

had first drawn my attention. The ladies were a little surprised, but I checked their critical glances for the moment. The naturalist pulled off his shoes, and while engaged in drawing his stockings, not up, but down, in order to cover the holes about the heels, told us in the gayest mood imaginable that he had walked a great distance, and had only taken a passage on board the *ark*, to be put on this shore, and that he was sorry his apparel had suffered so much from his late journey. Clean clothes were offered but he would not accept them, and it was with evident reluctance that he performed the lavations usual on such occasions before he sat down to dinner.

"He chanced to turn over the drawing of a plant quite new to him. After inspecting it closely, he shook his head, and told me no such plant existed in nature:—for M. de T. although a highly scientific man, was suspicious to a fault, and believed such plants only to exist as he had himself seen, or such as, having been discovered of old, had, according to Father Malebranche's expression, acquired a 'venerable beard.' I told my guest that the plant was common in the immediate neighborhood, and that I would show it to him on the morrow. 'And why to-morrow, Mr. Audubon? Let us go now.' We did so; and on reaching the river I pointed to the plant. I thought M. de T. had gone mad. He plucked the plants one after another, danced, hugged me to his arms, and exultingly told me that he had got, 'Not merely a new species, but a new genus.'

"When it waxed late, I showed him to the apartment intended for him during his stay, and endeavored to render him comfortable, leaving him writing materials in abundance. I was, indeed, heartily glad to have a naturalist under my roof. We had all retired to rest. Every person I imagined was in deep slumber, save myself, when of a sudden I heard a great uproar in the naturalist's room. I got up, reached the place in a few moments, and opened the door, when, to my astonishment, I saw my guest running about the room naked, holding the handle of my favorite violin, the body of which he had

battered to pieces against the walls in attempting to kill the bats, which had entered by the open window, probably attracted by the insects flying around his candle. I stood amazed, but he continued running around and round, until he was fairly exhausted; when he begged me to procure one of the animals for him, as he felt convinced they belonged to a 'new species'. Although I was convinced to the contrary, I took up the bow of my demolished Cremona, and administering a smart tap to each of the bats as it came up, soon got specimens enough.

"M. de T. remained with us for three weeks and collected multitudes of plants, shells, bats, and fishes. . . . We were perfectly reconciled to his oddities, and finding him a most agreeable and intelligent companion, hoped that his sojourn might be of long duration. But one evening, when tea was prepared, and we expected him to join the family, he was nowhere to be found. His grasses and other valuables were all removed from his room. The night was spent in searching for him in the neighborhood. No eccentric naturalist could be discovered. Whether he had perished in a swamp, or had been devoured by a bear or gar-fish, or had taken to his heels, were matters of conjecture; nor was it until some weeks after, that a letter from him, thanking us for our attention, assured me of his safety."

That this incident, so charmingly told, is amusing, its popularity with other writers full well attests, but it contains certain internal incongruities that lead one to suspect that it is grossly exaggerated. Particularly does this impression grow on one who reads carefully that portion, omitted here, which recounts the famous bear and cane-brake episode. There could have been but one purpose in Audubon's mind, and that was to

make the hero of the episode as ridiculous as possible. The story never found its way into print until Rafinesque had for some years ceased to be a resident of the State, and even then, in its original form, dared not name him as the real hero! But this failure to name Rafinesque makes the turpitude of Audubon the greater. And add to this another episode in itself far less harmful than the bat story, but infinitely more disreputable in its nature and results, and the reader of Rafinesque has just cause of complaint. Audubon played upon the credulity of his guest, who had implicit confidence in him as a brother naturalist. The host simply lied to Rafinesque, and seeing him eagerly accept the proffered bait still further abused his confidence and did a most unmanly act, one which has caused great annoyance and loss of time to succeeding naturalists. Audubon drew figures of some impossible fish, giving them gaudy coloration and glowing descriptions, and supplied Rafinesque with what purported to be notes of fact; all of these Rafinesque duly copied into his own note-book. Furthermore, the host described to his guest impossible limpet-like shells, said to live in the Ohio, and these were likewise carefully noted. Later, Rafinesque used these so-called facts as the bases of new genera and species; then Audubon employed the data known only to himself to make Rafinesque ridic-

ulous.* I have long had a suspicion that Audubon had taken the whole naturalist world into his confidence, in many of his bird biographies, and that some of his facts would sometime result in romances. The more I know of him and his methods the more I am convinced that this is true. But, in this case, a guest was made the innocent victim of misplaced confidence in his host; and the host in the rôle of a confidence man never inspires faith. Men to whom Audubon told the tale, attempting to justify it as a joke, have used the facts to the detriment of the fair fame of Rafinesque.†

From Henderson to the Mississippi.

Rafinesque left Henderson and the home of Audubon for a journey to the mouth of the Ohio, which point he reached as the farthest point in all his western travels. On his way he passed through New Harmony, Indiana, which was then one of the great scientific centers of the New World. In that quiet town on the Lower Wabash

**Vide* Contributions to North American Ichthyology, I, p. 6, 1877. Also, Rafinesque, by David Starr Jordan, in Popular Science Monthly, Vol. XXIX, No. II, p. 217, June, 1886.

†The following are the names of fishes bestowed upon the "drawings communicated by Mr. Audubon": *Perca nigropunctata, Aplocentrus calliops, Pogostoma leucops, Catostomus anisopturus, Catostomus niger, Catostomus fasciolaris, Catostomus* (?) *megastomus, Pylodictis limosus, Accipenser macrostomus, Dinectus truncatus.*

dwelt Say, and Owen, and Maclure, and LeSeuer, names all yet held, and deservedly, in the highest honor. He did not long remain in that retired place, the foundation principles of which impressed Rafinesque with its Utopian character. Much of the return journey from the mouth of the Ohio was accomplished on foot, "having found the horse too fatiguing". His destination was Lexington, but he went by way of Louisville in order that his collections might be put in the care of his friends, the Tarascons, and by them transmitted to Pittsburg. Rafinesque had not yet knowledge of the fact that he would become a resident of Kentucky. His only care was to make as large collections as possible and get them safely away to Philadelphia.

First Visit to Lexington.

It was a roundabout way that carried Rafinesque to Lexington on his first visit. The towns of Shepherdsville and Frankfort were visited and several side excursions taken. At length he reached Lexington and found his former Philadelphia friend, Clifford. This visit and the kindness of his reception, together with the opportunities for study and collecting that seemed to present themselves, coupled with the persuasions of his friend, deter-

mined Rafinesque to come to Kentucky, and this he did after a visit to Philadelphia to "settle my concerns and withdraw from trade". The chief fact that influenced him to this decision appears to have been the promise of Clifford to secure for him an appointment to a professorship in Transylvania University. Clifford was himself an enthusiastic geologist and indefatigable collector; he had amassed a considerable collection of fossils, and these helped Rafinesque in reaching a decision. Moreover, Clifford looked with great favor on the scientific work of his guest, and one may well be sure that the guest appreciated this fact. Already Rafinesque had been made aware of the hostile feeling that many men of science entertained toward him, for to some of them he had shown himself a formidable rival.

The visit to Philadelphia again gave Rafinesque occasion to know something of the perfidy of man and especially, it may be supposed, of Sicilians. He had intrusted certain of his business adventures to a Sicilian, who proved false to his trust and bankrupted and defrauded him of all his earnings. Finally, however, a start westward was made, business affairs left behind, goods shipped, and for the third time Rafinesque crossed the Alleghanies. The journey began in May, 1819, and ended in the heart of the bluegrass region of Kentucky

in middle summer. Rafinesque found the University in the midst of vacation, and hastened to join Clifford, who was spending the summer in scientific recreation in the country.

Rafinesque at Transylvania University.

The institution to which Rafinesque had now come had a stormy career. It was the outcome of an act of the legislature of Kentucky which had amalgamated two earlier and rival schools, the fact having been consummated in 1798. The two institutions whose fortunes were thus joined were the Transylvania Seminary, established in 1783 by the Virginia Legislature, and the Kentucky Academy, established by the Presbyterians in 1796. Considerations of economy, on the one hand, and the evident fact that rivalry such as theirs would only result in permanent injury to both schools, on the other, led to the amalgamation. The University was now under the celebrated Holly *régime*, its president, the third to hold the office, being the Reverend Horace Holly, LL. D.

Rafinesque became connected with this school in the fall of 1819, and at a time when there were internal dissensions. To this untoward condition must be added the fact that he was a stranger, of foreign birth and

with foreign air, and, further, there must be considered the fact that his chair was new and counted of but little importance. Those were the days of a classical education, purely and simply, and there was no interest in any other roots than those of Latin and Greek origin or in leaves of other sort than those which had the cabalistic signs of men who thought and wrote two thousand or more years ago. He who could quote freely and at length from Horace or Juvenal, or could see in Pindar and Demosthenes meanings of which they themselves never dreamt, was the educated man.* It mattered not how little he might know of gravitation or of dynamics, of bugs or of plants, if only he knew our ancient Latin friends; his education was then complete. Amid literary surroundings such as these Rafinesque now found a home. It would be difficult indeed to find another degree of literary difference so marked as that between Rafinesque and his associate professors. They were, in tastes and pursuits, as unlike as men could be;

*It needs only in support of this statement that attention be called to the character of the articles which constitute the bulk of the *Western Review and Miscellaneous Magazine*, published at Lexington, about this time. Its pages contain many labored literary articles, and not a few philosophical ones, in which classical training ran amuck through all the fields of knowledge, compelling attention to its demands to the exclusion of all else. The political articles, which appeared from time to time, continually refer to Greece and to Rome, to Xerxes, to Hannibal, to Epictetus, to Cæsar, and to Augustus.

their intercourse was necessarily a continual contrast of ideas and theories determined, on the one hand, by effete philosophical systems, and, on the other, by hasty generalizations based upon incomplete knowledge of natural surroundings. It was, in epitome, a renewal of the long-continued warfare between the classics and science, without that tempering of zeal and expression which is so characteristic of real culture or of exact knowledge. Rafinesque brought to the Kentucky metropolis of that day the habits of thought and views of State polity which were the outgrowth of his foreign birth and residence. From Sicily to Kentucky was indeed a great change; little wonder is it that he did not speedily adapt himself to these new conditions. Evidently, his real place among his colleagues must be estimated along other lines than those which found expression through his associates in Transylvania University. The beginning of the Kentucky life of Rafinesque was marked by a signal misfortune. With Clifford he was planning numerous excursions, one at least of which contemplated a visit to Arkansas, when Clifford succumbed to a sudden fatal illness. In this blow Rafinesque lost the only man whom, as I believe, he ever loved. In vain will you search his published writings for expressions of regard for others, whether men or women;

the only name mentioned tenderly and with evident regard is that of Clifford. Of all the men with whom Rafinesque came in contact Clifford alone seemed to enter into the life of the naturalist, and the influence of that association was greater than all the world beside.

The seven years of life at Lexington were very busy ones for Rafinesque. He made many excursions, some of which extended into Tennessee, and during which nearly all the accessible portions of Kentucky were visited. He made most extensive collections, chiefly in conchology and botany, though he neglected no branch of natural science. Numerous papers were written, and many of them published; at the same time he attended to the ordinary duties of the class-room. He was the secretary of the Kentucky Institute, the first scientific society formed within the State, and one of the first, if not the first, west of the Alleghanies. Doctor Horace Holly was the President of the Institute, before which a number of persons, and Rafinesque most of all, read scientific papers. Some of these were afterward printed in the *Cincinnati Literary Gazette.* The exploration and mapping of the ancient monuments which are near Lexington were accomplished during these years. But the most remarkable work of all was the preparation of the *Ichthyologia Ohiensis*, which has caused such

criticism from students of American fresh-water fishes. More will be said of this remarkable book in another place.

Attention has previously been directed to the Botanic Gardens with which Rafinesque was acquainted at Marseilles, and to those of Bartram and Marshall near Philadelphia. One of the ambitions of his life was the foundation of similar gardens at Lexington. To accomplish this he spent much time and developed a wonderful amount of energy. In 1823 he brought the matter to the attention of the State legislature, at Frankfort, with such success that the senate passed the bill to establish the proposed garden at Lexington; the house refused its sanction and the bill failed to become law. Though disheartened by this result Rafinesque did not wholly despair. He undertook the private solicitation of funds, the scheme contemplating the formation of a joint stock company. His friends and others interested in the undertaking succeeded so far as to get the projected garden incorporated. Ground was purchased within the village of Lexington;* planting was begun;

*The *Kentucky Reporter* of the issue of Monday, November 22, 1824, has editorial mention of the purchase of the land for this garden. The location was the upper end of Main Street, and comprised ten acres. A Mr. Harper was the treasurer of the company "on whom the stockholders are expected to call and pay the 1st and 2d installments on their shares."

but many who had subscribed failed to meet their obligations and the attempt was at last entirely abandoned. His dreams were never realized. He says of the undertaking, long after its collapse, "I never owned an acre of ground; this garden would have been my delight: I had traced the plan of it, with a retreat among the flowers, a Green-house, Museum and Library; but I had to forsake it at last, and make again my garden of the woods and mountains." Nothing of historic importance grew out of the enterprise; nor could such result have been expected in this inland village at such an early day. Aside from Rafinesque there was probably not a single person in Lexington who knew any thing of the real nature and cost of these enterprises; nor did he, seemingly, remember the existing untoward conditions under which the enterprise was bound to end in failure. The scheme could not appeal to the cupidity of those to whom stock was offered, for every dollar put in it went in to stay from the very nature of things. Scientific interest was impossible in men trained to other habits of thought, nor were the times ripe for the expenditures of considerable sums of money in a community still contending with a virgin forest for the very mastery of the fields themselves. The episode, however, serves a useful purpose in that it emphasizes the influence on

the life of Rafinesque of the surroundings of his boyhood days.

In connection with the attempt to secure favorable legislative action in the matter of the Botanic Garden a serious illness resulting from exposure to a prevailing epidemic enters into the record in such manner as to illustrate another side of Rafinesque's life. He says: "I took the measles then prevailing, and was very sick on my return to Lexington; but I recovered in spite of the Physicians, by taking none of their poisons, antimony and opium, while many died in their hands." Clearly Rafinesque had little regard for the disciples of Æsculapius!

According to the account contained in the "Life of Travels", with the governing body, or better, perhaps, the executive head at Transylvania, Rafinesque did not enjoy the most pleasant relations. Doctor Horace Holly, the President, did not look with favor on the natural sciences, and having himself no especial training in them was not prepared, perhaps, to appreciate their importance. Nor were the relations which Rafinesque sustained toward his associate professors more cordial. He complains that they intrigued one against another,*

*There does not seem to be sufficient warrant for this statement of Rafinesque. General and ex-Senator George W. Jones, of Dubuque, Iowa, who was a

and that there was little "subordination among the students".

It can not be positively stated that the frequent and long excursions, which Rafinesque made while a professor at Transylvania University, were allowed to interfere with his lecture appointments or his other class-room work, but it would seem incredible that they did not. He was engrossed in his field-work, surrounded with a flora both new and beautiful, a circumstance in itself calculated to appeal strongly to the heart of the naturalist; shells and fishes totally unknown and often unique furnished additional inducement to relieve the weary monotony of the class-room. It even may be surmised, with strong degree of probability, that some of the dissensions of which he speaks were to be referred to this probable interference for their origin. But among the causes, whatever else they may have been, must be considered that of a certain autocratic bearing and distaste for the opinions of others which is said to have been quite characteristic of him.

student in Transylvania University, and who was graduated in 1825, writes me in answer to enquiries on this subject as follows: "I never knew of any disagreements between the professors in Transylvania University, but I recollect how bigotted religionists in Lexington and in Kentucky persecuted President Holly and drove him from the head of the institution in 1826, then the most distinguished in the whole world. . . . The university went down and was an irreparable loss to society and to learning from the moment President [Holly] left the institution."

He was widely read and kept in touch with most of the work of his day, but he does not seem to have clearly interpreted all of his authors. In another place will be found an estimate of his literary style which, as attested by the very voluminous bibliography published from Lexington, was none too clear; he delved in every field of knowledge, and covered in his reading and his writings almost every field of research. Subjects meteorological, geological, botanical, chemical, veterinary, astronomical, philological, theological, engaged his attention, and were all made matter for several memoirs. He even attempted poetry, sometimes in Latin, or French, or English. These facts simply attest the work of a mind devoid of the power of concentration. That these peculiarities were known to his associate professors is certain; that this knowledge had some influence in determining their judgments of him is equally evident.

In 1823 Rafinesque undertook a considerable journey across Middle Kentucky and into Tennessee, reaching the Tennessee River. The unsettled character of the country only prevented him from making the journey westward to the Mississippi. On the return trip he visited Mammoth Cave, of which he says, "I spent one day to survey it, and found it very different from the printed exagerated accounts, but yet wonderful

enough." Lexington was reached in July, and in August and September the regions of Eastern Kentucky, as far as Cumberland Gap and the Falls, to Pine Mountain, were explored. This journey was the last that Rafinesque made within the bounds of Kentucky.

While resident at Lexington Rafinesque had perfected a "patent and Divitial Invention," which, in 1825, prompted a journey to Washington to take caveats and patents. This is described in the following language: "This Invention consisted chiefly in rendering Bank Stock and Deposits and Savings circulable by divisible Certificates; which will one day be certainly adopted. . . ." This has always been the basis of the claim of Rafinesque that he was the inventor of the coupon system now so common on bonds and similar instruments. It was on the return from this journey that he "found how the President of the University had behaved" in his absence. He censured that official in no measured terms; said he:

"I returned to Frankfort and to Lexington, . . . To evince his hatred against sciences and discoveries, he had broken open my rooms, given one to the students, and thrown all my effects, books and collections in a heap in the other. He had also deprived me of my position as Librarian and my board in the College. I had to put up with all this to avoid beginning law suits. I took lodgings in town and carried there all my effects: thus leaving the College with curses on it and Holly; who were both reached by them soon after, since he died next year at sea of the Yellow fever, caught at

New Orleans, having been driven from Lexington by public opinion: and the College has been burnt in 1828 with all its contents. But Clifford's cabinet was saved (like mine) by being removed previously like mine, and is now partly in Cincinnati and partly in Philadelphia. This was a lucky escape."*

First Object Teacher in Kentucky.

During the time that Rafinesque occupied the chair of modern languages and the natural sciences in Transylvania University, was introduced west of the Alleghanies the modern method of object teaching. During the three winters from 1823 to 1826, among other duties he lectured on medical botany to the students in the medical department, giving his course with "exhibition of specimens". In this he was far ahead of the teachers of his time, and introduced a method which now everywhere obtains among competent instructors.

*It will probably never be known what led to this action on the part of President Holly, but it would appear to have some relation to absenteeism on the part of Rafinesque. It is but just to the memory of the famous Transylvania University President to say that always Rafinesque had received cordial welcome to his home. The following facts appear to controvert the opinion Rafinesque had formed of the President; they are quoted from a letter I have received from an inmate of the Holly household, by permission: "He [Rafinesque] was a great admirer of Doctor Holly and came frequently to the house to talk on subjects of interest to him. He was never an inmate of the house although his face was a familiar one there. . . . He wrote verses, English, and Italian, and Latin, I think, and brought them to find an audience with us. . . ."

In still another matter he appears to have antedated some more modern observations, as may be gathered from the following facts:

"He often lectured to the students in College and in a most entertaining manner to the great delight of his audiences. His lecture on the ants was peculiarly instructive and interesting, causing many of the students to laugh heartily when he gave us the history of ants, especially when he described them as having lawyers, doctors, generals and privates, and of their having great battles and of the care by physicians and nurses of the wounded, etc., etc. . . .

"I would now give any reasonable sum to hear him repeat one of his lectures that I listened to in Transylvania University."*

Skilled indeed must have been the mind that could fix facts like these in such manner that they endured for seventy years!

RAFINESQUE AS A LECTURER.

Much of the time of Rafinesque in the University was employed in teaching the modern languages, in which he again was the pioneer of the West. Transylvania University, through him, has thus a remarkably important place in the history of higher education west of the Appalachians. But it would appear that the professor and naturalist, notwithstanding the wide range of his scientific investigations and the great number of papers

*General Geo. W. Jones, *in litt.*, Aug. 25, 1894.

prepared for the press, still had some leisure which he desired employed. To fill the full measure of his desires he formed and conducted classes in the modern languages outside the college walls; he lectured on scientific subjects to the people of Lexington; he gave instruction in botany to all that desired it. In illustration of the wide range his activities acquired, the following notices from various numbers of the *Kentucky Reporter* published during 1821 and 1822 may serve:

"TUITION."

"Prof. Rafinesque Teaches the French Italian and Spanish Languages, in the University and gives also private lessons to the ladies in town."

"He will give private instruction in the University or in town in the following branches—Elements of useful knowledge, Botany, Geometry, Map-Drawing etc." (*Kentucky Reporter, January* 15, 1821.)

Later, in the spring of the same year, when the plant life of the region was about to awaken for the new botanical year, he thus advertised:

"PROFESSOR RAFINESQUE

Will begin to deliver his Course of Botany as soon as a class shall be formed:—he invites those who are willing to attend it to apply to him immediately."

"He continues to give private instruction in the French & Italian Languages etc. Also in several branches of other knowledge."

Sometimes during this period Rafinesque essayed the lecture platform. As in his writings, so in his lec-

tures to the public a very wide range was given to his subjects. He was not often on the lecture platform, but there are several mentions of lectures in the *Kentucky Reporter* for the years 1820 to 1822 that are interesting, inasmuch as they show us how he occupied some of the leisure of college life. Among these notices the following are characteristic of the man:

"TRANSYLVANIA UNIVERSITY.

Professor Rafinesque will deliver a Public Lecture, introductory to a course of Medical Botany Medical Mineralogy Medical Zoology &c, in the Chapel of the University, on Wednesday next, 21st Nov. at 12 o'clock. The Medical Professors, Students etc. are invited to attend as well as the ladies and gentlemen of Lexington."

"If the weather should prove unfavorable it will be postponed to the next Saturday at the same hour." (*Kentucky Reporter, November* 19, 1821.)

The next year his public lectures appear to have taken an entirely different direction. They then seemed to have been suggested by his studies on the matter which was finally included in his historical works or works on ancient nations. The psychological tendency of his researches is evident from the notices which are here reproduced:

"A PUBLIC LECTURE."

"On the Human Mind will be delivered (weather permitting) on the 22nd of April, Monday next, at 12 o'clock in the Chapel of Transylvania University by Prof. Rafinesque as an Introductory to

a course of Lectures on the Natural & Moral History of Man Kind.

"The Ladies and Gentlemen of Lexington are invited to attend." (*Kentucky Reporter, April* 15, 1822.)

The only mention of a lecture accompanied by a fee for admission is found late in the year 1822, and, like the last preceding, the address belonged to the realm of metaphysics. The notice runs as following:

"LECTURES ON PRAENOLOGY."

"Professor Rafinesque will deliver a discourse by request on Phraenology Craniology & the Analysis of the Human Mind, on this evening at 7 o'clock in the Medical Room.

"Admission Fifty Cents. Tickets to be had of Mr. McNitt, at the lecture room & at Mr. Deveins." (*Kentucky Reporter, December* 16, 1822.)

Curiously enough there never occurs any reportorial or editorial notices of any of these lectures; there is absolutely no means of ascertaining any thing relative to their reception by the townspeople. Nor, among the frequent "letters" to the editor in either criticism or praise of the various departments of the University, and such letters were numerous, for these were stormy times in University matters, have we found a single one which mentions, to say nothing of being chiefly concerned with, Rafinesque's work or the department of science over which he presided. It would appear that he toiled

along alone, with little of counsel or of help. Unappreciated he certainly was, his quaint ways and habitual obliviousness of his surroundings subserving that end.

Rafinesque was a frequent contributor of "open letters" and short articles to the Lexington newspapers, and some of these are quite quaint and interesting. He always seemed to believe that the general public felt as much interest in natural history details as he himself did; perhaps, however, the fact that many rare and little known forms of animals were brought to his notice by the curious around him explains an interest which he thought was general; in this way, perhaps, his own interest he came to believe was common to all who read the newspapers. A single example will serve to indicate the nature of these newspaper contributions, none of which are deemed of sufficient importance to constitute a portion of the bibliography given in this volume. From several articles the following is selected:

"THREE NOTICES OF NATURAL HISTORY."

"By Prof. C. S. Rafinesque."

"1. The singular & rare animal, lately killed in Ohio county in this state & described in the last Argus as a Leopard is by no means the African but the American Kaguar (*Felis onca* of Linneus) which is found all over S. America & Mexico. It has sometimes been seen in Louisiana & the state of Missisipi but had not yet wandered so far north,

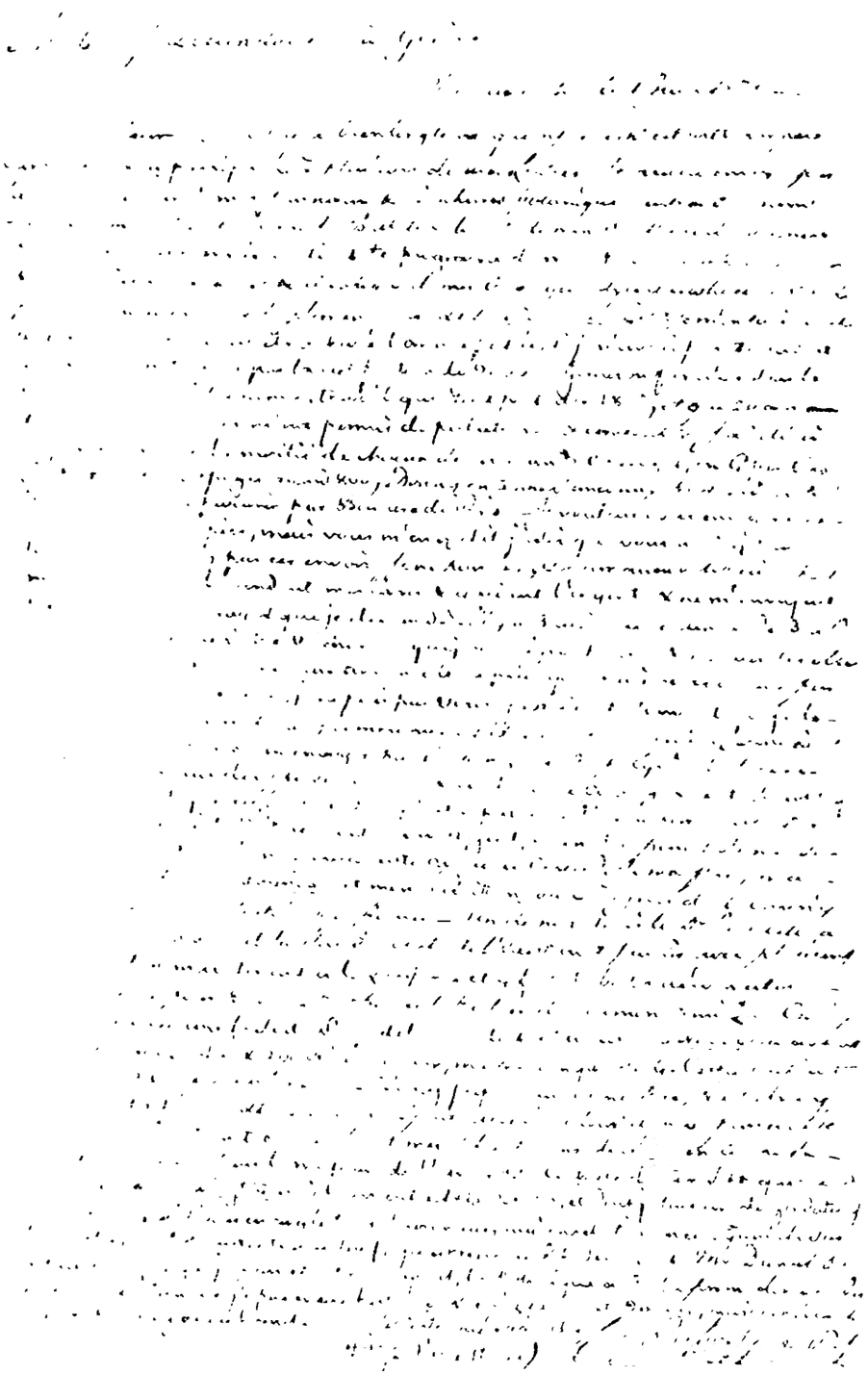
"2. I have lately discovered in the neighborhood of Lexington the real Scull-cap or *Scutellaria laten flora* so much extolled in New York against the bite of mad dogs or hydrophobia. It grows along the branches of S. Elkhorn near Wm. Bryan's, 5 m. S. W. from town. I shall be ready to show specimens of it to anybody willing to know the plant & cultivate it.

"3. If anybody living on the banks of the Ohio Kentucky, or other streams where the muscle Shells are common wishes to establish a manufacture of Real Pearls I shall be willing to communicate to them all the different processes needful to the purpose of compelling the Muscles to form their Pearls, for a small consideration, or for a share in the profits. The capital needed for such a manufacture is a convenient place & from $50 to $100. The profits may amount to from $100 to $10,000 in a year, according to the size of the Pearls produced."

"PR. C. S. RAFINESQUE"

(*Kentucky Reporter, September* 6, 1820.)

Rafinesque had, in previous years, formed the acquaintance of President Jefferson, whom he had visited at his Monticello home. The interest of Jefferson in matters scientific was well known to Rafinesque, who had often written him personal letters. Also during these years in Lexington he frequently wrote open or published letters to persons of celebrity, among whom were Cuvier, Banks, De Candolle, Bory, and others. Three of these letters are preserved in the *Kentucky Reporter* for the dates 22d and 29th August and 6th September, 1820. They are so very characteristic of the man that they should be useful in undertaking an estimate of his



Mr le Prof. Decandolle à Genève

Philadelphia le 1 Jan. 1838

Monsieur — Il y a bien longtems que mes Correspondants et amis me font un reproche convenable avec raison par rapport à plusieurs de mes Lettres Journaux envoyés pour la poste plusieurs de mes Journaux & Bulletins botaniques, outre autres nouveaux Herbarium, attendu Journal, Bulletin, le N.J de mon Bulletin des Sciences Naturelles de cette année contient le programme de mes Nouveaux plantarum Americanarum & Flora Tellusiana, et le Catalogue de mes Ouvrages. Ayant entrepris en 1836 de publier enfin ma flore supplementaire de l'Amerique Sept.: j'en entrai à occuper tout de bon, elle aurait été achevée à l'année passée, si j'en avais pu être indemnisé à double montant il par la rectification de 2000 N. Genres ou familles dans la nouv. de Flora Tellusiana, travail qui devait être fait dès 1815, et que 20 ans de d'observ. continuelles n'ont permis de perfectionner & completer. J'ai déjà imprimé & publié la moitié de chacun de ces grands Ouvrages, en Quarto (2 chaque) de 1000 pages grand 8vo, dont on a connaissance aux Botanistes de toutes les parties par Bailliere de Paris — Je voulais vous envoyer une Caisse avec 12 Copies, mais vous m'avez dit jadis que vous n'étiez pas Libraire & n'en vendiez pas ces envois: je ne peux exporter sur aucun libraire pas même Bailliere, ils vendent mon Latin & gardent l'argent, & ne m'envoyent par même les Ouvrages que je demande — Il y a 3 ans que je demande 3 à 6 Copies complettes de votre Recherches que j'aurais pu placer d'avance les volumes, j'en ai vu 5 volumes, un ami me la prêté pour mais ne les a pas encore entièrement à la main, je ne puis pas vous quoter exactement vous ont que la Vue de suite — Serres depuis que comme un état de chose, désigne ainsi N.os. Libraire de Paris de ne s'occuper que l'entreprise de Mess. Cyrus de Martens 2 Copies en moins des prod. complet, & tout autre Ouvrage vient Synoptique Botanique tel que Agardh, le N.G plantes publié à Vienne par Endlicher — & je leur remettrai de suite le montant en argent, vous en 500 francs de mes Ouvrages à vendre — J'imprimerai cette année la Continuation de ma flore, sous le Nov Sylva of North America, et mon Prodrome ou Synopsis de l'Amer. Sept. & ailleurs illustrées par figures — Un de mes Amis le Dr Richardson a publié un appendice de la flore des Etats de l'Ouest en 2 parties avec plusieurs N. Esp. il est maintenant à la fonderie et y fait des belles découvertes — J'ai acheté pour 150 ou 750 francs l'Herbier de feu mon ami Zac. Collins où j'ai trouvé une foule de N. Esp. de la Floride & ailleurs. Ma New Sylva contient 100 Nouveaux Arbres & 200 N. Arbrisseaux, ma Monographie du G. Cactus contient 15 Esp. 9 Arbres & 6 Arbrisseaux — Torrey prépare aussi une flore, Nuttall y joint de plus les plantes d'Orégon, Ils paraissent devenir jaloux de mes progrès je les devance — Ayant eu à offrir mes Chartillons des N. Esp. en Europe j'ai compté les dépenses dans le Museum de l'Université Centrale de l'Am. Sept. qui y a été fondée à Lexington en Kentucky entre 1840 & 1850, et dont j'étais un des fondateurs

Comme vous le verrez en ces lettres, j'aurais mettre mes relations avec plusieurs de mes élèves zélés, ou Botanistes travailleurs, qui sont devenus Mr Swinney, & Mr Durand de Jefferson aussi zélé que jamais et Mr Wagner, la Botanique a fait la fortune de mes Etudes et dans une des mines, j'espère mener heureux & comfortable pendant 20 ans, mais j'en ai encore aussi de plusieurs autres branches — Votre dévoué Serv. & Ami C. S. Rafinesque Prof.

(172 Vine Street)

RAFINESQUE TO DECANDOLLE.

[Reduced one-fourth.]

mental life. These three are addressed, "To the Honorable Thomas Jefferson, Late President of the United States." The first is an introductory one, of a column and a half length, "On Alleghawian Records"; the second constitutes a "Description of the Alleghawian Monuments In the neighborhood of Mount Sterling, Montgomery Co. Kentucky"; the third, a column and half long, has the following title: "On some Allegawian Implements etc". The mounds or works are quite fully described in these letters, as well as their probable uses, or better, perhaps, the uses which Rafinesque supposed they had subserved; the same treatment was accorded the implements.

FROM 1825 TO 1840.

Rafinesque left Lexington and Kentucky in June, 1825, taking with him all his possessions. He left Transylvania University of his own accord, driven to desperation by the treatment accorded his collections. He turned his footsteps eastward; his work west of the Alleghanies had ended. So far as is known he never visited again the regions to the west. As first, in 1802, so now, in 1825, he at last made Philadelphia his home.

It is impossible to follow with very much detail the last fifteen years of his life. The facts are too little

known and have, so far as known, too great likeness to warrant minute statement. He continued his numerous excursions to the very last, and during these journeys always explored new regions. These few years sufficed to take him to nearly all the Middle Atlantic States and furnished him with very many opportunities to study the mountain flora of the northern Appalachians. Some of his larger works were composed in great part during these last years, and a number of them were published. From the time he left Transylvania University he experienced considerable difficulty in getting his numerous papers published; very many of them never would have seen the light in printed form, were it not that he essayed the establishment of one or two literary and scientific periodicals. These, like his earlier adventure of similar nature in Sicily, came to sudden ends, through failure of subscribers to pay, and through failure of publishers to print without cash payment. Some literary enterprises, extensive in nature, for which he was not well equipped either in training or in means, were projected, and some, like his "Tellus," were to compass the whole world in their scope. This last ambitious project was partially consummated, and is represented by two volumes, printed in Philadelphia, in 1836. The widest possible range of subjects is included within his

writings of these years, testifying strongly to his inability to concentrate his mind and work.

The most interesting fact connected with this portion of the career of Rafinesque is his attempted application of his medical information to the treatment of consumption. He has commonly been regarded as a "quack" during this part of his life. However he was far from such in fact. There is the essential distinction, first of all, that Rafinesque really believed in his medicines and in his treatment. In his will may be found a paragraph to which attention is directed in this connection. For some years he had made and advertised a medicine, sold in several forms, to which he gave the name of "Pulmel," and concerning the virtues of which he wrote a book. His methods, then novel—and Rafinesque always seemed to be in the lead in novelties—were not at all unlike those now adopted by respectable firms for the advertisement of their own nostrums. He published a number of statements of cures, reliefs, and similar matters, just as is now done under cover of the certification of a reputable physician. While it is probable his decoctions and pills and powders possessed very little therapeutic value, it is not quite clear that they were less valuable than many that now are heralded, world-wide, as possessing virtues and powers that are incredible.

It should also be remembered that Rafinesque was driven by the necessities of a poverty almost unspeakable, in the midst of a city of plenty, to do some things with his "Pulmel" which he probably never would have done under any ordinary circumstances. The determination to owe no man anything; to secure the publication of his books; to get and arrange new plants and other natural history objects; to complete the exploration of the northern Alleghanies, were all-controlling motives with him. It was not sordid gain that drove him to medical concoctions, but a sincere desire to get by fair means, in an honorable way, the opportunity to do good and be of service to mankind. I believe that Rafinesque did good as he understood and felt it; that he had a nature susceptible of appreciating kindnesses, and that, in his way and to the best of his knowledge, he was of a philanthropic mould.

Of this particular episode in the life of Rafinesque it would be well, perhaps, to allow him to speak. He says:*

"Having cured myself completely in 1828 of my chronic complaint, which was the fatal Phthisis, caused by my disappointments, fatigues, and the unsteady climate; which my knowledge in medical botany enabled me to subdue and effect a radical cure: I entered into arrangements for establishing a Chemical manufacture of vegetable remedies against the different kinds of Consumption. This

*Life of Travels, p. 87.

succeeded well. I introduced also a new branch of medical knowledge and art. I became a Pulmist, who attended only to diseases of the lungs, as a Dentist attends only to the teeth. Being thus the first Pulmist, and perhaps the only one here or elsewhere. This new Profession changed my business for awhile; yet enabling me to travel again in search of plants or to spread my practice, and to put my collections in better order, publishing many pamphlets, &c.

"In 1829 I gave a public proof of my art, in printing a small book called the Pulmist or the art to cure the Consumption, and many hundreds of individuals, whom I have cured or relieved are another striking proof of the beneficial results of my new practice."*

Rafinesque did not entirely abandon pedagogy when he left Kentucky. In the winter of 1826–27 he lectured on physical geography and natural history in the Franklin Institute, and afterward, during part of 1827, was "professor of Geography and Drawing in the High school of

*This book, the full title of which will be found in the bibliography accompanying this sketch, was caustically reviewed by the editor of "*The Western Journal of the Medical and Physical Sciences*," Volume III, 1830, pp. 417, 418, 455. The review is included in a series headed "The Peoples Doctors," which deals with books of a character similar to that of Rafinesque. The most remarkable thing connected with the review lies in the fact that its author, Doctor Daniel Drake, had never seen the volume! He says, p. 417: "We have not had the advantage of seeing the Professor's 'doctor book,' the title of which is prefixed to this article, but his circular lies before us. . . ." I have no defense for Rafinesque's foolish book, with the contents of which I am familiar, but I can not enter too strong a protest against treatment of this sort, and against reviews by reviewers, who have never seen the works of which they write. But this method has not been confined to the doctors, evidently, as a perusal of some of the articles in the "Rafinesquiana" herewith published will abundantly testify.

the same Institution." In September of the same year he left this post, and so far as known never again entered a class-room as instructor. Ill health seriously interfered with all his manifold occupations, but he still kept on writing, amassing notes, publishing fragmentary articles, and devoting not a little time to inventions and to his medical business.

The Six Per Cent Savings Bank.

Probably the most interesting business adventure of Rafinesque during these later years was the proposal, elaboration and establishment of a kind of savings bank which he called the Divitial Institution and Six Per Cent Savings Bank. This institution had been a favorite scheme for quite ten years before final organization. The men who went into the scheme were all men of small holdings; wealthy people would have nothing to do with it. It paid stockholders six per cent, and loaned money at the same interest rate. The first year of its operation the bank divided a dividend of nine per cent among the stockholders. How money could be borrowed at six per cent, loaned at six per cent, and current expenses be paid, does not appear, unless, indeed, "the commissions, fines, and casualities",

which he mentions, proved a prolific source of income! Many similar institutions were proposed and established at this time in Philadelphia, but Rafinesque lumps them all together and declares that they were all gambling institutions. The bank was still in existence at the death of Rafinesque, but nothing can be learned of its real history. It is not a little singular that the earliest and the latest business ventures of Rafinesque alone appear to have succeeded. All the rest is a record of continuous failure.

The Death of Rafinesque.

The closing scenes in the life of this man are of the saddest nature imaginable. He lived in the most abject poverty on Race Street, Philadelphia, in a garret, surrounded by his books, minerals, plants and other loved natural objects. He shunned the company of others and had no, or but few, real and tried friends. Scientific recluse that he was in these days, there were none to care for him and help him in time of want. His scientific loves were still strong, and he struggled along in the unequal battle with fortune in the face of a disease which had no relief save in death. The end came in 1840, when, alone in his crowded garret, in a poor quarter of the great city, he died of cancer of the stomach.

Language can not adequately portray the emotions that arise as these words are written. Here was a man who for years had loved and wooed that coy goddess whom we call Nature; a man who had the soul to appreciate both her richness and her profligacy; whose varied fortunes, both in letters and in means, seem as the details of a romance; he had at last paid the penalty of being a part of that same Nature. He died without a word to cheer him, without a tear shed for him. Rafinesque! The name had gone to every land where science is cultivated. Rafinesque! The name had been bandied about in jest and contumely by those who should have hailed him as brother. Rafinesque! Dead! He yet lives and will live as long as plants shall be studied and classified; as long as fishes shall unwittingly fall in the net of the searcher; as long as the waters of the West shall give life to mollusks; as long as changing stream or fleeting cloud or moving star shall bear a message to men. Long may the name of him who studied them all and loved them all and understood them all be revered by those who regard the labors of the pioneer!

Rafinesque had been dead to the world of brightest minds for some years. The experiences through which he had passed, which involved some of the saddest that come to men, had so broken him that there is little

question but that he was not of sound mind during these latest years. He was not, however, the irresponsible madman some would have us believe; rather, his was monomania, and took the direction of descriptions of new forms of animal and plant life. But, more than this, his defect was that peculiar form of monomania which believed only in himself; which saw in his own work a value that does not always attach to it; which made him neglect the work of others, or, if it were noticed, impelled him to caustic and unwise criticism.

It is related of his burial, that when a few men, whatever the motive that prompted them may have been, learned of his death and assembled to give the dead decent entombment, his landlord refused permission of burial; he hoped to find a market for the body in a medical school, and thus obtain the rental Rafinesque could not pay when living. The body had been locked in a room adjoining that in which death had come; the door was forced open in the presence of his last and faithful friend, Doctor William Mease, and an undertaker by the name of Bringhurst; and what remained of Rafinesque was let down by ropes into the back yard and then conveyed to its resting-place.*

*This statement was first published in the Philadelphia *Ledger* Supplement, May 5, 1877. It is reproduced entirely in the American Naturalist, 1877, Vol. XI, pp. 574, 575. *Vide* "Rafinesquiana" at the end of this volume.

The unfortunate naturalist lies buried in Ronaldson's Cemetery, Ninth and Catherine streets, Philadelphia. In 1861 the place was marked by a plain board slab on which was painted simply "C. S. R." To-day the spot where he was buried is unmarked.

Disposition of the Property of Rafinesque.

All that Rafinesque possessed in the world is summed up as personal property in the items of his will. When it was learned that he was dead and that his property would be sold at public auction, there was an unseemly haste on the part of some persons to get possession of his treasures, whatever they were. Eight dray loads of books and natural history collections comprised the mass of his "estate". They went to the auction rooms of the city and were publicly sold, in violation of the provisions of his will, which required private sale. There is no intimation in the return of the executors that any attempt was made to comply with its requirements. His manuscripts on archæologic subjects were bought by Professor S. S. Haldeman, and eventually found their way, most of them, into the hands of Brantz Mayer, of Baltimore, formerly consul for the United States to Mexico. Thence many finally reached the United States

National Museum at Washington, where some are still preserved. The National Museum possesses also several note-books in which are recorded Rafinesque's observations during some of his numerous travels; in addition, there are an unpublished paper on the fishes of New York and Pennsylvania, and the manuscript of a proposed "Conchologia Ohiensis."

Many of the archæologic manuscripts of Rafinesque eventually found their way into the hands of Squier and Davis, the authors of the immortal "Ancient Monuments of the Mississippi Valley". Such parts as suited their purpose these gentlemen employed in its compilation. Most of this work of Rafinesque on the ancient peoples of America seems to have disappeared from view in Baltimore.

The collections of Rafinesque had suffered much from neglect and inability properly to care for them. Labels were lost and misplaced; indeed most of the mineral and conchologic materials were entirely without labels, and were sold for mere trifles. The botanical collections were badly injured by mice and other vermin, and were in sad condition; most of the plant collection sold as waste paper. A few good specimens were secured by Mr. Isaac Burk, and by him presented to the University of Pennsylvania, where, it is to be presumed, they still are. A

considerable collection of plants, named and studied by Rafinesque, may be seen in the Jardin des Plantes, in Paris, where they form a portion of the *Herbier Durand.* Mr. William Hembel presented to the Philadelphia Academy of Natural Sciences that portion of the herbarium of Rafinesque which contained the plants on which were based the descriptive portions of the Medical Flora. These descriptions are said to possess very great value to-day, and it is very agreeable to know that the plants are still in existence. They, together with other valuable European and Oriental plants, had been purchased at the sale of the estate of their owner. A collection of *Annelides*, or marine worms, made by Rafinesque, also found its way into the Philadelphia Academy's collections.* The rest are gone forever; that they really possessed value is uncertain.

The books which Rafinesque left appear to have been especially the quest of the greedy purchasers who attended the sale. Some were sold at private terms, as the will directs that all should be, but most of them went at public auction. The return of the executors, appended to the will, demonstrates that the Medical Flora, published in two volumes, had certain value. One man, a

* *Vide* "A Notice of the Origin, Progress, and Present Condition of the Academy of Natural Sciences of Philadelphia." By W. S. W. Ruschenberger, M. D., 1852, p. 27.

physician, "took eight copies", another took "a lot". The books are now much sought after and possess a certain intrinsic value which did not then seem to be appreciated. The final settlement of the estate left it indebted to the administrator in the sum of fourteen dollars and forty-three cents. Rafinesque appears to have been despoiled of his rights in nomenclature while living; he was despoiled of his possessions when dead.

The Personal Appearance of Rafinesque.

There are living very few persons who have seen Rafinesque. But since interest always attaches to the physique of remarkable men, the attempt was made to obtain descriptive accounts from such as still might be alive. In this matter there has been a certain measure of success. The portraits which accompany this work will disclose the rest.

The published description of Rafinesque by Audubon* has long been the only source of information as to his personality, and is reproduced here because chronologically the first. Audubon writes as follows:

"A long loose coat of yellow nankeen, much the worse of the many rubs it had got in its time, and stained all over with the juice

**Vide* Ornithological Biography, Vol. I, p. 456.

of plants, hung loosely about him like a sack. A waistcoat of the same, with enormous pockets, and buttoned up to the chin, reached below over a pair of tight pantaloons, the lower part of which were buttoned down to the ancles. His beard was as long as I have known my own to be during some of my perigrinations, and his lank black hair hung loosely over his shoulders. His forehead was so broad and prominent that any tyro in phrenology would instantly have pronounced it the residence of a mind of strong power. His words impressed an assurance of rigid truth, and as he directed the conversation to the study of the natural sciences, I listened to him with as much delight as Telemachus could have listened to Mentor."

In regarding this description it should be remembered that Rafinesque had reached Henderson after a long and varied journey down the Ohio. The "ark", in which he last had voyaged, had not the means of polite toilet making; soiled clothing and unkempt beard, in a river village of Kentucky, in 1818, should have excited neither comment nor wonder.

A delightful and authentic account of Rafinesque, not as a rambling collector merely, but as a college professor, has been furnished me by one whose mother knew Rafinesque.* The account is given exactly as it came to the writer. Says this lady:

"There are few persons now living who remember Professor Rafinesque. My mother, then a girl of ten or twelve years of age, recalls him distinctly, and describes him, as did all I have ever heard speak of him, as a most eccentric person; his extreme 'absent-

* Miss Johanna Peter, of Lexington, *in litt.*

mindedness' contributing to his foreign ways to make him peculiar. His students were not slow to perceive that he made an excellent target for their practical jokes, and having but small esteem in those days for natural science as compared with classical attainments, they showed him little respect. His lecture room was the scene of the most free and easy behavior, made possible by the total absorption in his subject of the lecturer, who was always totally oblivious to his surroundings when occupied with his favorite pursuits. In appearance Professor Rafinesque was small and slender, with delicate and refined hands and small feet. His features were good and his eyes handsome and dark, or apparently so from the long, dark eye-lashes. His hair, which he wore long, was dark and silky. He went into society while in Lexington and was a good dancer but had no companions, being totally abstracted, usually, with his own thoughts and having no conversation, although he spoke good English, save on his favorite topics of botany, etc. On these he was an enthusiast. He was a clever draughtsman and often made sketches of persons in his company. Mrs. Holly, the wife of the President, took a motherly supervision over this lone, friendless, little creature, while at Transylvania University, and saw that he ate his dinner, that the mud of his various expeditions was removed from his garments, that his hair was combed and his face was washed, as often any or all of these particulars would be forgotten by the oblivious scientist. . . . For my own part I always felt sorry for poor Rafinesque, because he was a stranger and because all the young people made jokes at his expense. These he is said never to have noticed apparently, but I believe a man of his fine mind must have felt more than he showed. At any rate he appreciated kindness that was shown him although he knew none of the arts that make a man popular. He was well known to my grandmother and to my great-grandfather, Samuel Meredith, who then lived at this old country place, "Winton," where I am writing. Rafinesque often walked here from Lexington,

seven miles, in search of specimens which he found in North Elkhorn creek and to investigate the ancient Indian forts which traverse this farm."

A second valuable account has been furnished by General George W. Jones, of Dubuque, Iowa, who was a student in Transylvania University from 1821 to 1825. He writes:*

"I recollect the learned Professor Rafinesque perfectly well and his physiognomy and general appearance are now visible to my mind's eye. He was in personal stature about the size and appearance of my deceased friend, the late John Quincy Adams, but I think he had a full suit of hair and black eyes. . . . Professor Rafinesque had a room in College proper, and was a man of peculiar habits and was very eccentric, but was to me one of the most interesting men I have ever known."

And again, in a letter replying to questions connected with the genuineness of one of the portraits of Rafinesque, which is published in connection with this memoir, General Jones writes:

"I do not think that either of the pictures of Professor Rafinesque† represents him correctly as I remember him when I knew him as Professor of Natural History in Transylvania University, in Lexington, Kentucky, from 1821 to July, 1825. The photograph is certainly a better likeness than the other picture. I never saw him

*Letters dated August 25 and August 30, 1894.

†These were a photograph of the painting of Rafinesque in the Wisconsin Historical Society, and said to have been made by the celebrated Jouett, and the portrait of Rafinesque published by the *Popular Science Monthly* in April, 1892. The *Popular Science Monthly* portrait appears to have been copied,

dressed so finely or so fashionably as this photo represents, for he was an extremely eccentric man in his dress, as well as in his manners, and was always the object of ridicule by the younger students of the University. They would fill his room with smoke from cigars at night when he would leave it. I was always very intimate in the family of President Holly and know that Professor Rafinesque was always a favorite in his house and especially with Mrs. Holly, who was one of the most excellent and charming, intelligent ladies that I ever knew."

Still another account, kindly furnished by one who often saw him and to whose home Rafinesque frequently came, differs in some minor details from the preceding. This account says:

"As I recall the old man he was a small, peculiar looking Italian, with a large, rather bald, head and stooping figure, very scientific, absorbed in his books and his bugs, his researches and his writings, a genius with many peculiarities and not much dignity. . . . I don't know where or how he got his meals. His room was in the College building and was a curiosity, filled with butterflies and bugs and all sorts of queer things. The students played tricks upon him, and the young folks were amused by his funny ways. He seemed to me an amiable gentleman, an innocent, inoffensive sort of man, hardly appreciated at the time. . . ."

A single other account, by a former student at Transylvania University, may prove of use in relation to the

without credit, and with some modifications, from the one published in *Potter's American Monthly*, Volume VI, 1876. The last mentioned was made from a painting owned by Doctor William Kent Gilbert, of Philadelphia. This painting is a reproduction of the portrait of Rafinesque which forms the frontispiece to the "Analysis of Nature".

physique and habits of Rafinesque. For it I am indebted to the courtesy of Judge Belvard J. Peters, of Mt. Sterling, Kentucky. He says:*

"I was a member of the graduating class of 1825, with Gen'l G. W. Jones, in the Transylvania University, Kentucky. I remember Professor Rafinesque, and my recollection is he was a man of low stature, not more than 5 feet 10 inches in height, strongly built, and capable of great physical force; his head rather larger than usual, square shoulders but not stooped, dark grey eyes, and dark hair. While there was nothing in his countenance inviting to strangers, there was absolutely nothing forbidding. His face was far from being ruddy; but pale or perhaps wan is the best word, indicating to me that his color was the result of hard study, for he was a great student. He seemed to me to be careless of his style of dressing, indeed, his clothes never fitted him and appeared to have been made for some one else and he got them by accident. I think he was not a cheerful man. I have no recollection of having ever seen him enjoy a hearty laugh (as we Kentuckians would say). He was an eccentric man, doubtless as much so as any account you have of him represents him to have been. I never heard, and do not believe, that his relations with Prest. Holly, or any of his colleagues, were unpleasant. I never knew nor did I ever hear of any such trouble. Prest. H., as I understood, was a Unitarian and Professor Bishop was a Scotchman and Presbyterian of the straightest sect, and but little intercourse [existed] between them. Prest. Holly was the victim of persecutions of Presbyterian and Baptist preachers, the first named the most bitter. They never ceased their war upon him until they forced him to resign in the Spring of 1827, and he was elected President of the New Orleans College, and in July, 1827, he took yellow fever, on shipboard, going from New Orleans to Boston, and died 31st July, 1827. His body

* *In lit.*, dated September 24, 1894.

was committed to the deep, 'the Scholar's cloak was his winding sheet, the ocean his grave, and the towering rocks of the Tortugas his monument.' . . . But to quit this episode and return to the Professor. I do not remember ever to have heard him lecture. He was professor of Geology, but I think Botany was his favorite study. He spent much time in the mountains of Kentucky and in investigating the quality of the different soils and their adaptability to the production of various plants, vegetables, etc."

From these facts it would appear that, for some reason, Rafinesque had changed his feeling of friendliness into one of hostility to Doctor Holly, and that this new condition was not justified. The account Judge Peters has so kindly furnished helps us to understand the wonderful physical force which must have been Rafinesque's, for he toiled always and without apparent rest.

No ordinary physique could have endured such ceaseless activity, performed such arduous journeys, collected such numbers of natural objects, prepared so many articles for publication, and filled so completely the post of professor. He most certainly was a man of indomitable will, of unbounded enthusiasm, of great energy. These are his virtues. On them we are content to rest his case.

The Portraits of Rafinesque.

The portraits of Rafinesque, which we present in this volume, have an interesting history. The frontispiece represents the author of the "*Analyse de la Nature*" as he

appeared in Sicily, in 1810, and, therefore, at the age of twenty-seven years. It is a reproduction of the portrait of Rafinesque which constitutes the frontispiece of that volume. On it was based the painting owned by Doctor William Kent Gilbert, of Philadelphia, which is reproduced by Chase in his sketch of Rafinesque in *Potter's American Monthly*, previously mentioned. The portrait as there presented loses some of its charm and its unique character. The picture is a very interesting one in that it so well shows some of the peculiar features thus early developing in the mental life of the naturalist. The wide range which his studies and his activities already had assumed is indicated by the ornamentation of the plate. Modelling his work after Linnæus he sought to establish it on probity and philosophy. They constitute the foundation stones of the character which he hoped to build. The birds of the air, the animals and plants of the fields, the fishes and mollusks of the waters, are all included in the illustration as reminders of the diverse directions in which his energies had been expended. He was a merchant, and the son of a merchant; he had been a traveller; and so, in the offing, there appears a ship under full sail. A happy conceit this, if we only pardon the bit of personal vanity which it implies.

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Your Friend
C. C. Rafnesque

FROM THE PAINTING BY JOUETT IN THE WISCONSIN HISTORICAL SOCIETY'S COLLECTION.

The second portrait of Rafinesque is presented with some misgivings. There are some differences between the two that do not appear to be sufficiently well explained by time and harsh experiences. This portrait is a photograph of an oil painting, on a black-walnut tablet, now in the possession of the Wisconsin Historical Society, at Madison, through whose courtesy it is allowed presentation here. It was purchased as a portrait of Rafinesque by the late Doctor Lyman C. Draper, some time secretary of the Society, in one of his numerous trips through Kentucky, or to Philadelphia, about 1876. No memoranda accompany the painting other than the name of Rafinesque and the date of purchase. Both portraits have been seen by persons who knew Rafinesque, but opinion on them is very equally divided. Of the frontispiece there is no doubt whatever; of the second illustration only the facts above mentioned can now be given.

RAFINESQUE'S SCIENTIFIC WRITINGS.

Rafinesque's Scientific Writings.

UNDER the most favorable circumstances it often becomes very difficult properly to estimate the scientific work of a pioneer in natural science. And when that work consists largely of papers printed in scattered magazines, some of which do not possess a distinctively scientific character, the task becomes doubly difficult. In the case of the work of Rafinesque it is not only that he published in magazines of this ephemeral character, but that his work pertains to two continents, which makes the final estimate extremely difficult. His papers are now rare, notwithstanding the great liberality with which he distributed them among scientific men. He disdained beauty and conventionality, ignored typographical art, and his larger works, books, and extended memoirs, were printed mostly in small and cheap editions, and none of them may be regarded justly as fair exhibitions of the book-maker's art.

Rafinesque's literary activity began in 1803, when he published his first paper, a work devoted to notes on certain birds, which he had seen in Peale's Museum,

in Philadelphia, and extends uninterruptedly until 1840, the year of his death. The number and character of his papers differ in such marked manner that there may be recognized, justly, three separate periods, during each one of which his work had a distinguishing character. The first may be said to comprehend all the published work of Rafinesque during his Sicilian residence; the second, and also the period of most valuable literary effort, will include the years of residence in Lexington; the third, the period of vagaries, will comprehend the fifteen years of second residence in Philadelphia. Under these three major classifications, then, we will attempt an analysis of his scientific writings.

Scientific Work in Sicily.

The work of Rafinesque on the fishes of the Mediterranean Sea, in that portion which borders Sicily, was the first of its kind to possess any, really scientific, value. Many new species and genera of fishes were discovered by him; and the results of considerable of his ichthyologic work are still held to be valid. This work was accomplished while Rafinesque was yet a young man. He had gone to Sicily fired with a love for every thing natural; his zeal had been intensified

by a few years' residence in the United States, during which period he was associated with our earliest naturalists, who had, at least, that enthusiasm which always results from work in a virgin field. His new surroundings were full of incentives to work; his early training had disposed him to wide observation; successful business ventures had provided means for travel and collection; a famous naturalist, Swainson, was with him, to encourage and to help. Add to these the fact that the fishes and shells, the plants and the animals of the land were unknown, or, if known, were not fully understood, and the extraordinary character of much of Rafinesque's work will be explained. In the midst of a profligate Nature he saw, on every hand, subjects for note and formal memoir. During this period of his scientific life those discursive habits of thought, which must result from a training such as he had received, rendered less exact a pen that otherwise might have done valuable service in the cause of original human knowledge.

The published work of Rafinesque on the Sicilian fishes departed widely from the accustomed methods of study and classification, which had obtained in Europe, and especially among the French *savants*. He made careful notes, that is as careful as Rafinesque ever made, of the objects he described, from the fresh and living

specimens. The markets and the fishermen furnished his materials. He borrowed, from the work of others, information and facts as suited his purposes; he was not always as careful to give full credit, as is the modern writer, to the sources of his information. This subjected him to severe criticism; yet, be it remembered, little had previously been learned concerning his field of work. Cuvier, a great naturalist, but one who was entitled also to the appellation of "closet naturalist" more justly, perhaps, than any other man of his day, finds fault with Rafinesque for divers reasons. The criticism which he offered is the first severe one that had occurred in contemporaneous literature. He said of Rafinesque's "*Indice d'Ittiologia Siciliana*":

"He has besides entered in his catalogue, without examination, all the species given by Lacepédé and Linnæus as belonging to the Mediterranean, which has caused him to reckon several which are purely imaginary, and this extends even to his genera: thus his *Aodon*, taken from Lacepédé, is the *Raie cephaloptere;* his *Macrorhapus*, taken from the same source, is the *Centriscus*. He has greatly multiplied the genera, and sometimes on slight grounds; so that, without reckoning those which are not inhabitants of the Mediterranean, there are 139; and yet, notwithstanding his readiness to make these divisions, he has not done so in circumstances in which it would be imperatively commanded by the laws of classification. He leaves, for instance, the anchovy in the herring genus, and the plaice in that of the sole; while of the single Linnean genus *Squalus* he has made sixteen." "These two works are, nevertheless," con-

tinues Cuvier, "very worthy of attention, on account of some original ideas, and of the descriptions and figures of the fishes themselves, which are to be found nowhere else. The author also has paid attention to the Sicilian names of most of his species."*

Of this work of Rafinesque on the fishes of Sicily, perhaps no better judge could be found than Swainson himself, the companion and friend of Rafinesque. He was familiar both with the objects described, and the conditions under which they came to the hand of their nomenclator. Says Swainson, in a defense of the work of Rafinesque:

"The year 1810 was remarkable in the annals of our science for the appearance of two important works on the ichthyology of the Mediterranean; one was by M. Rafinesque Schmaltz,† subsequently Professor of Natural History in Lexington, U. S.; the other, relative chiefly to the fishes of Nice, was from the pen of M. Risso. The first of these is of much importance; and from particular circumstances, will claim more of our attention than would at first appear necessary. M. Rafinesque's Sicilian works are now become so very scarce (the greater part of the unsold copies having been lost at sea), that few naturalists will have the power of consulting them. His chief ichthyological work is a synopsis of 'New Genera and Species of Animals and Plants' found by the author in Sicily;

* Quoted by Swainson in Lardner's Cabinet Cyclopedia, Vol. I, p. 60, 1838-1839.

† Rafinesque says, in his "Life of Travels", p. 34: "Prudent considerations had already induced me to add the name of Schmaltz, my mother's name, to my own and to pass for an American." These considerations are, properly, to be connected with the Sicilian and French wars of his time.

and this was followed by a pamphlet entitled '*Indice d'Ittiologia Siciliana*'. The details of the new views of M. Rafinesque, in regard to classification, are too long to be inserted in this volume, but they will be occasionally adverted to. The faults that have been dwelt upon* in these two works are such as all authors, even M. Cuvier himself, is not exempt from; they seem to us, in short, too trivial for the notice of the historian, and too general to be affixed to any one author in particular. We freely admit that M. Rafinesque (then living, as we were, in a remote part of Europe, cut off, by the late war, from all intercourse with the Continent) was not well informed upon the current and almost daily discoveries going on there; and that some few of his species, then supposed new, were really not so: but who is exempt from such errors, if errors they are? or how are such co-incidents to be prevented, when naturalists, in distant places, and unknown to each other, are working at the same time on the same subject? On the other hand, it must not be concealed that M. Rafinesque anticipated, by nearly ten years, a very large proportion of the generic and subgeneric distinctions subsequently taken up in the *Regne Animal*, in the first edition of which it is clear that its learned author was totally unacquainted with the works above mentioned, or that he was unconsciously repeating, under new names, a considerable number of the genera and subgenera long before established in the volumes of Professor Rafinesque. It would have been well had these unintentional errors been rectified in the second edition, or in the general ichthyological work of MM. Cuvier and Valenciennes; but they are not so; and naturalists will judge how far this is consonant with common justice, or with that law of priority which is the only safe-guard to the reputation we all covet. The generic characters of Rafinesque are as simple and intelligible as those of Linnæus, and the derivation of their names strictly classical and euphonious. In regard to the majority of

* Mentioned above in the extract relating to Cuvier's criticisms. [R. E. C.]

those species which have been termed 'imaginary', or inaccurately described, our firm conviction is, that nearly all, eventually, will be as fully established as those of the best known in our systems. We have formed this opinion, not from theory, but from actual observation, and from having verified, in many instances, the validity of Rafinesque's characters. The truth is, that Sicily is perhaps the richest field for the ichthyologist, of any yet explored in the Mediterranean, in whose warm and prolific waters, washing the tranquil shores of so many islands, an immense variety of fish are constantly found. Besides these two works, more especially devoted to the ichthyology of Sicily, many other papers by the same author are scattered in the periodical publications of Palermo; and he has also given a most original and valuable account of the fishes of the great river Ohio."

The same writer gives additional information, in the form of a foot-note, that is quite useful in determining the character of Rafinesque's methods during the time he studied the fishes of Sicily. Says he:

"In further justification of the opinions here advanced, it may be proper for me to state that I had the pleasure of M. Rafinesque's society, during the three years of my official residence in Sicily, from 1807 to 1810, and again in 1812, when we were both at Palermo, prosecuting our botanical and ichthyological researches together. Circumstances have hitherto prevented me from giving them to the public; but an extensive series of drawings and descriptions, made from the life, of the Sicilian fishes, not only confirms the accuracy of M. Rafinesque, in many instances where he has been charged with error, but affords strong ground for believing that one half of the Sicilian species, said to be found also in the Atlantic Ocean, Britain, etc., are, in reality, quite distinct. M. Rafinesque, unfortu-

nately, was unable to publish more than a synopsis of his ichthyological discoveries; and his figures, being very slight, are often not calculated to clear up those doubts which the brevity of his descriptions sometimes creates; nevertheless, to one who examines the species on the spot, in a fresh state, there are few which may not be identified. M. Cuvier often asserts that all M. Rafinesque's species were described from preserved specimens, but this is an error — they were all taken from the life. We both used to frequent the fish-markets, and we procured all our specimens there, or from fishermen who were in our employ. I was frequently urgent with my friend to preserve, at least, such as were the most remarkable of his new genera, anticipating the incredulity that has since been attached to them; but this advice, unfortunately, he never adopted. The greater part of those which I examined, after being drawn and described, were thrown away, or eaten; a military life not being suited to the formation of such collections; but many of those species met with near Palermo, were preserved in spirits and sent to the British and Zoological Museums; few, however, of these are now in existence. One cause, perhaps, of the errors of M. Cuvier regarding the Mediterranean fishes, may be that he had only examined preserved specimens, either distorted by stuffing, or bleached and shrivelled by alcohol, so that it becomes often difficult to recognise the most common species. If I have dwelt too long on this subject, I hope the benevolent and candid reader will excuse me; it has originated in my desire to do adequate, though tardy, justice to one whose whole life has been devoted to science, and who has been singularly unfortunate in his worldly concerns; who, notwithstanding his eccentricities, has a kind and benevolent heart; and whose labours have never been appreciated as I think they deserve."

It is with some marked degree of pleasure that, to this favorable estimate of Swainson on the value of

Rafinesque's work, there is to be added the statement that, almost yearly, in some one or another of the scientific journals and periodicals, or in the proceedings of learned societies, occasional recognition is accorded to some of the genera established by Rafinesque's Sicilian work. Gradually the real, underlying facts are coming to be known, and when known there are not wanting men to do him justice. A feeling quite distinct from that which prompted the adverse criticisms of Cuvier is apparent in the work even of those who refuse to allow him his names; they attempt, at least, to understand the work which this pioneer in Sicilian ichthyology had accomplished.

The study of the fishes of Sicily is almost the sole zoölogical work of real and lasting value performed by Rafinesque while a resident of that country. It formed the ground-work of the whole subsequent superstructure; it was the first one to illustrate the forms described. It partakes of the fault common to all the natural history work of the time, in that the generic and specific diagnoses are brief, and altogether unsatisfactory, when measured by modern standards. But it was a pioneer study; it became the real foundation of all that followed it.

One of the more interesting facts connected with this work of Rafinesque consists in the circumstance that

he early recognized the artificial character of the Linnæan system in use in the classification of plants. He was a close student of Jussieu, upon whose system most of his own botanical work was based. During the period of these Sicilian publications Rafinesque proposed various arrangements and methods of classification, not alone of plants but of all organized bodies. It hardly need be said that these systems were not checked by that wide observation, and by that careful comparison of material, gathered from all the quarters of the globe, which alone could make a system of permanent value. His schemes experienced the same fate that all systems, which are based upon limited observation, must have befall them. They are regarded now as scientific curiosities. Of these Rafinesque's *Principes Fondamentaux de Somiologie, etc.*, and his *Ordini Eltrologici o Definizioni Ordini, etc.*, easily have the first place. Numerous articles of similar character may be noted in the *Specchio delle Scienze, etc.;* the *Analysis of Nature, or Survey of the Universe and the Organized Beings*, is an elaborate attempt of the same import.

Another literary venture of Rafinesque, in this period of Sicilian residence, was the proposed reprint or reissue of the *Panphyton Siculum* of Cupani. This famous and rare work was found by Rafinesque in the library

of the Jesuit Fathers, at Palermo. With the design of making it more accessible to others he had the entire work copied "on oil paper at great expence". Something like one hundred and twenty of the seven hundred plates he had engraved; most of them were devoted to the illustration of Sicilian plants. The work was never completed; all that is known of the venture is the statement by Rafinesque, in his "Life of Travels", that these plates went down in the Race Rock shipwreck off New London. The idea of a complete copy of this work, made in the manner described, seems to have had its inception in another plan of Rafinesque to monograph the natural history of Sicily entirely and completely. Most of the leisure of the ten years' residence in the island was devoted to the collection and study of natural objects with the one purpose, ever in mind, of some day completing this self-imposed task. In some certain sense this will account for the wide range over which his studies and writings, at that time, extended. Much of his work finally found its way into print through the medium of various scientific journals, and through the medium of the journal which Rafinesque himself established, and carried to the completion of the second volume, the *Specchio delle Scienze, etc.* Writing on many subjects, and without monographic

care, it is not wonderful that many papers published during this time possess so little real value.

An episode of considerable interest occurred in the last year of Rafinesque's Sicilian residence. It was the reception of his first diploma of membership in a learned society. The Academy of Natural Sciences of Naples bestowed the honor. The item is insignificant in itself, but it seems to have aroused a desire in him for other similar honors. The method by which some of these doubtless were secured may be gathered from a letter by Rafinesque, published a few years since.* This letter is here presented in full, not only for the reason above assigned, but also because it indicates that Rafinesque had in mind, for the cryptogamia at least, an extensive work on American plants, and thus helps to a further understanding of the wide range of his literary efforts. The letter runs as follows:

"PALERMO, Jan. 28, 1807.

"DOCTOR M. CUTLER.

Dear Sir:—I had the pleasure to receive last month, via Marseilles, your esteemed favor of 8th May last, and being the first that reached me from you since I am in Europe, you may easily conceive how gratifying it has been. I perceive by it that you had formerly wrote me and sent me some plants via Leghorn, which both never came to hand, and I regret it exceedingly, but have no

*Life, Journal, and Correspondence of Rev. Manasseh Cutler, LL. D. Vol. II, pp. 311–314. 1888. Robert Clarke & Co., Cincinnati.

doubt but that the next parcel you have the goodness to promise me will make up that loss.

"I feel very sorry for the disorders you have experienced and regret that, conjointly with some business, they have prevented you to arrange your herbarium and favor us with another essay on the plants of New England, but trust that God will grant you health and leisure to accomplish both, and hope that you will at least favor me with the catalogue and descriptions promised; they will be gratefully acknowledged and mentioned when I shall publish my travels and essays on the Nat'l Hist. of the Plants of the U. S., and expect soon to receive the plants you mention to prepare, one of which you say is a new genus, and if it be correct I am willing to name it Cutlera, and alter the other plant named so. I trust you will renew occasionally, or at least once every year, sending me a large parcel of plants; you know already most of those I want, but to refresh your memory you will find hereunder the names of the principals, as well as the names of the plants lost in the passage, which I don't doubt you will have the goodness to collect for me this season. My friends, Messrs Dawes, Ingersoll, etc., of Boston, who propose returning to Sicily this year, will by my desire acquaint you with the time of their departure. Any Captain coming from Salem to Palermo, and they are many in the course of the year, will also willingly take charge of such things for me, and in *default* you may address any package or letter to my friends here-under mentioned in several ports of the Mediterranean.

"In return of your kindness, and according to your desire, I now send you a parcel of Sicily plants, to which I join a few specimens of n. sp. of American plants, such as I can conveniently spare. Here-under you have the particulars of same. I hope they will prove acceptable. Among the Sicilian plants there are many new sp. I have discovered. I am sorry to say I have no curious seed to join to them at present. I inclose three copper plates of as many new American criptogamic Genera Carpanthus, Volvaria,

and Aedyeio. I get many others engraved here, and intend they should make part of an essay on the natural history of American fungi, that I shall publish in more peaceable times. I shall make it a point to forward you my productions. I contemplate a natural history of all the vegetables in America, and perhaps the animals likewise, and whatever communications on those beings you may choose to make will be highly acceptable.

"My leisure is now wholly engaged in investigating the Nat. history of this Island, which I likewise contemplate to achieve, and I am already very far advanced with the plants, Birds, Fishes, and Mollusks, and I shall soon begin the remaining classes.

"It has always been my wish to be associated to some American philosophical or botanical Society or Academy, and I suppose it would not be very difficult to be aggregated as Corresp'd Member through your means; and in case it should not be so easy as I conceive, please to point out to me the means to become such. If communications, presents of books or Natural curiosities, should be necessary before or after, I am willing to send such as you will think most proper. Your particular attention to this will infinitely oblige me.

"Please to mention what new books or discoveries have been published in America on any part of Natural history.

"If your friend Mr. Wm. Peck, or any other gentleman, would also enter into a Botanical Correspondence with me, it would be very gratifying for me. Pray what has the Erica returned to some Andromeda or Dabœcia? or what?

"I remain, truly,

Your most obedient servant,

C. S. RAFINESQUE SCHMALTZ,

Chancellor of the American Consulat, Palermo.

"P. S. I could not get the parcel of plants ready for this opportunity, but I shall send them by another, the William Gray, that sails for Salem in fifteen days, and the Super., Mr. Waldo, will take charge of them."

The circle of acquaintance with men of science, which Rafinesque assiduously sought ever to widen, included very many of the foremost naturalists of Europe. During his Sicilian residence he corresponded with very many of the men who have been famous in French annals of science; his acquaintance with the naturalists of Italy appears also to have been cordial, and quite complete. Wherever he could get a new plant, find a new shell, obtain new information, there Rafinesque sought and made acquaintances. In this way it happens that so many of the names of men who have achieved renown in the annals of European science during the earlier portions of this century find a place in the personal memoirs of Rafinesque. That, in after years, they withdrew from these relations finds an explanation solely in the fact that in his published writings he was not always careful to give proper credit for information so derived, or in the fact that these relations became strained from the attempt to turn them to purely personal ends. Whatever may have been the real cause, but few of all the scientific men with whom Rafinesque corresponded, during his Sicilian residence, remained to him in the rôle of true friends. Swainson alone, in England, defended him to the last; on the Continent there was left not one.

Scientific Work in Lexington.

The student of American science will find most of interest in that portion of Rafinesque's scientific work which was accomplished during his residence in Lexington. In some respects this period of activity was marked by certain features which were identical with those that had determined his Sicilian work. Rafinesque was the first naturalist to investigate at all fully the natural history of the Ohio Valley. He found an exhaustless and virgin field. A wealth of life, of every sort, was in constant notice in field, in wood, in stream. The larger and most common food fishes alone were known, and these were, for the greater part, without scientific name. Only an occasional mollusk, which had found its way to the cabinets of Europe from the hands of the earlier French residents along the valley, or the few forms which Say had discovered, were known to science. The birds and larger mammals had been made known, but in the fields where Rafinesque had worked longest and best there was a wealth of new and undescribed forms. The temptation to publish, while yet the nondescripts found had been but too carelessly studied, was so great that a flood of scientific papers proceeded

from the pen of our author. These were printed in various magazines, some scientific and some literary; others found a place in the proceedings of learned societies; still others were projected in book form; many were promised but never were realized. The first teacher of science west of the Appalachians, with numerous objects brought to him, either through curiosity or real interest, concerning which he had opinions to express, occupying a newly established science chair in the only western university, it is little wonder that Rafinesque found so much to interest him in all directions, and that he came to be a kind of Sir Oracle in the Kentucky backwoods.

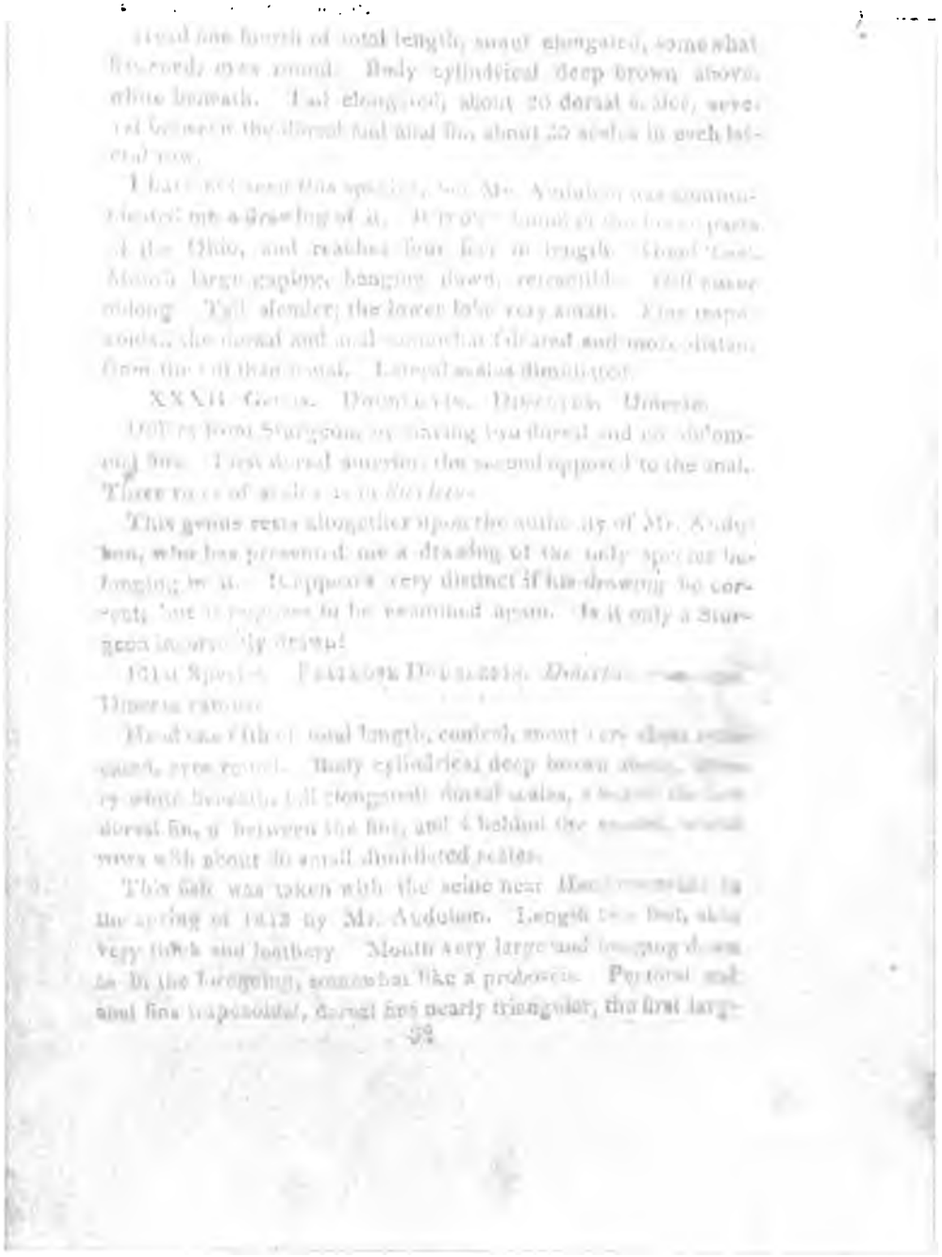
The nature of the papers printed during this active period of seven years will be gleaned best from the accompanying bibliography.

Two works in particular deserve especial mention in this connection. They are the "Fishes of the River Ohio", and "A Monograph of the Fluviatile Bivalve Shells of the River Ohio". These works were published about the same period, one as a serial in the *Western Review and Miscellaneous Magazine*, at Lexington, and the other as a monographic article in the *Annales Generales des Sciences Physique*, at Brussels.

THE FISHES OF THE OHIO.

The series of papers on the fishes of the Ohio was also issued in separate form, the volume being made up of oversheets from the magazine mentioned. The title given was the "Ichthyologia Ohiensis". A new brief introduction precedes the paper, which was wanting as it appeared in the *Western Review*, but in all other respects the work is identical. Since this book has been the subject of a most various comment, and since it affords a good index to the characteristic literary style of Rafinesque, it will be proper to give it more than a passing mention. Add to this the fact that it was the first work ever written on the Ohio River fishes, and has thus become the groundwork for all succeeding investigations, and it will be granted that full data respecting this remarkable book will be justified in this connection.*

*The "Ichthyologia Ohiensis" is now an extremely rare volume. Very few copies are known, less than a half dozen in all. The writer succeeded in tracing a copy from the library of the late Doctor Robert Peter, of Lexington, Kentucky, through the hands of Robert Clarke, of Cincinnati, to the Newberry Library, of Chicago. Not only did this institution refuse to allow us to make a photographic copy of the title-page, to illustrate this work, but even refused to allow us to see the book. Application made at the Librarian's desk elicited only the information, first, that the book was not in the library, and, second, when confronted by the Librarian's own letter to us acknowledging possession, we were informed that "the book could not be seen". It is felt that this statement is due to others, who may some time wish to consult rare books, in order that time and means should not be wasted in a fruitless journey to Chicago.



mentioned by Lesueur as a variety of his *A. rubicundus*, page 390 of the Trans. Am. Phil. Society, but it differs widely from it.

100th Species. Bigmouth Sturgeon. *Accipenser macrostomus.* Esturgeon beant.

Head one fourth of total length, snout elongated, somewhat flattened, eyes round. Body cylindrical deep brown above, white beneath. Tail elongated; about 20 dorsal scales, several between the dorsal and anal fin, about 30 scales in each lateral row.

I have not seen this species, but Mr. Audubon has communicated me a drawing of it. It is only found in the lower parts of the Ohio, and reaches four feet in length. Good food. Mouth large gaping, hanging down, retractible. Gill cover oblong. Tail slender, the lower lobe very small. Fins trapezoidal, the dorsal and anal somewhat falcated and more distant from the tail than usual. Lateral scales dimidiated.

XXXII Genus. Double fin. Dinectus. Dinecte.

Differs from Sturgeon, by having two dorsal and no abdominal fins. First dorsal anterior, the second opposed to the anal. Three rows of scales as in *Sterletus*.

This genus rests altogether upon the authority of Mr. Audubon, who has presented me a drawing of the only species belonging to it. It appears very distinct if his drawing be correct; but it requires to be examined again. Is it only a Sturgeon incorrectly drawn?

101st Species. Flatnose Doublefin. *Dinectus truncatus.* Dinecte camus.

Head one fifth of total length, conical, snout very short truncated, eyes round. Body cylindrical deep brown above, silvery white beneath, tail elongated: dorsal scales, 4 before the first dorsal fin, 6 between the fins, and 4 behind the second, lateral rows with about 30 small dimidiated scales.

This fish was taken with the seine near Hendersonville in the spring of 1818 by Mr. Audubon. Length two feet, skin very thick and leathery. Mouth very large and hanging down as in the foregoing, somewhat like a proboscis. Pectoral and anal fins trapezoidal, dorsal fins nearly triangular, the first larg-

FROM THE "FISHES OF THE RIVER OHIO."

Western Review and Miscellaneous Magazine, 1820.

The title-page of this volume furnishes a good illustration of the encyclopædic character which was given to all title-pages during the early part of the century. Its full reading is as follows:

Ichthyologia Ohiensis | or | Natural History | of the Fishes Inhabiting the | River Ohio | and its Tributary Streams, | Preceded by a physical description of the Ohio and its branches | by C. S. Rafinesque, | —— | Professor of Botany and Natural History in Transylvania University, Author of the Analysis of Nature, &c., &c., member of the Literary and Philosophical Society of New York, the Historical Society of New York, the Lyceum of Natural History of New York, the Academy of Sciences of Philadelphia, the American Antiquarian Society, the Royal Institute of Natural Sciences of Naples, the Italian Society of Arts and Sciences, the Medical Societies of Lexington and Cincinnati, &c., &c., | —— | The art of seeing well, or of noticing and distinguishing with accuracy the objects which we perceive is a high faculty of the mind, unfolded in few individuals, and despised by those who can neither acquire it, nor appreciate its results. | —— | Lexington, Kentucky, | printed for the Author by W. G. Hunt, (price one dollar). | —— | 1820. (One volume, 8vo, pp. 90.)

The title-page reverse has the following:

These Pages | and the Discoveries which they contain | in one of the principal Branches | of Natural History, | are respectfully Inscribed | by the Author | To his fellow-labourers in the same field of Science | Prof. Samuel L. Mitchill, M. D. | who has described the Atlantic Fishes of New York, | and to | C. A. Le Sueur, | who was the first to explore the Ichthyology of the Great American Lakes, etc. | In Token | of Friendship, Respect, and Congratulation.

In this way this remarkable book was launched. Many of the descriptions of fishes which it contains are still regarded as good; they are, of course, characterized by exceeding briefness, and must, many of them, be read in connection with the generic characters which precede them. There was certainly no opportunity of checking observations by the work of others, because the field was wholly unexplored and its fauna entirely unknown. It was impossible that errors of more or less moment should not enter into a book written piecemeal as this one was. It is also quite evident, to any one who has seen any of the fishes of the Ohio, that most of the descriptions are based upon actual observation. But it is also to be remembered that the descriptions were mainly made from the fresh and living specimens—in exact imitation of the method adopted by the same author in his work on the fishes of Sicily. These descriptions were placed in his note-books and afterward utilized in the preparation of the serial papers without the check afforded by comparison of specimens. Also, facts were collected after the publication of some of the parts in the *Western Review and Miscellaneous Magazine*, and these were then introduced, sometimes with change of the original names. A few forms had already been characterized in the *American Monthly*

Magazine; these species were not always kept distinctly in mind by Rafinesque. The result is a blending of characters and names that has caused very much confusion among students of American fresh-water fishes. Add to these the forms, described as new or made the basis of new genera, that had been "communicated by Mr. Audubon" and the chief elements of uncertainty are understood.

Numerous attempts have been made to determine the exact fishes which Rafinesque had before him in writing his notes; of these a record of varying success has been made. President Jordan, Messrs. Copeland, Girard, Cope, and L. Agassiz, at different times and for different reasons, have attempted to settle these matters. While the results are not altogether satisfactory, many names have been definitively fixed; while a few others have been abandoned. Among the latter are the names of the fictitious fishes, the drawings and descriptions of which Mr. Audubon had given to Rafinesque "for a practical joke", victimizing all future science far more than they did Rafinesque.*

Professor Louis Agassiz wrote,† in 1854:

"Nothing is more to be regretted for the progress of natural history in this country than that Rafinesque did not put up some-

*A list of these forms will be found on page 29, *antea*, in foot-note.
†*Vide* American Journal of Science, 2d series, Vol. XVII, p. 354.

where a collection of all the genera and species he had established, with well-authenticated labels, or that his contemporaries did not follow in his steps, or at least preserve the traditions of his doings, instead of decrying him and appealing to foreign authority against him. Tracing his course as a naturalist during his residence in this country, it is plain that he alarmed those with whom he had intercourse, by his innovations, and that they preferred to lean upon the authority of the great naturalists of the age, then residing in Europe, who, however, knew little of the special natural history of this country, than to trust a somewhat hasty man who was living among them, and who had collected a vast amount of information from all parts of the States, upon a variety of objects then entirely new to science. From what I can learn of Rafinesque, I am satisfied that he was a better man than he appeared. His misfortune was his prurient desire for novelties and his rashness in publishing them, and yet both in Europe and America he has anticipated most of his contemporaries in the discovery of new genera and species in those departments of science which he has cultivated most perseveringly, and it is but justice to restore them to him, whenever it can be done."

To this opinion should be added that of Doctor Charles Girard, who, writing two years later,* says:

". . . We find the laudable desire of attempting to bring back into use the long-forgotten genera of Rafinesque, which fell into disuse because of their own imperfection, and if they have not passed into the common nomenclature of the day it was owing to their defect more than to the partiality of naturalists; for we may well imagine how any one would feel when rebuilding another's work, as little known to the author as to the commentators themselves.

*Proc. Acad. Nat. Sciences, Phila., VIII, 165–213, 1856.

"And yet, for my part, I have always looked upon the restoration of Rafinesque's genera and species as highly desirable, as soon as they had once been proposed and introduced into science as names. But in order to do justice to the scheme, it was necessary to the undertaking that one should go to the very ground covered by Rafinesque himself during all seasons of the year, to enable us to discriminate between that which Rafinesque really observed and that which is imaginary."

The most serious, and at the same time most successful, attempt to ascertain precisely what fishes Rafinesque had before him in making his descriptions is that of President David S. Jordan in his "Review of Rafinesque's Memoirs on North American Fishes",* in which will be found a careful and well-considered attempt to settle these important matters. While later the results were modified slightly, this work stands as a faithful and judicious attempt to place Rafinesque in his proper relation to the work of his contemporaries and successors. It was the first, and, so far as our information extends, the only attempt at identification which has been made from personal study within the region in which Rafinesque had fished. All the rest, or nearly all, were attempts made to understand, from alcoholic materials, descriptions which were originally drawn from fresh specimens personally taken by Rafinesque, or

* Bulletin U. S. National Museum, No. IX, 1877.

obtained from fishermen. The writer of the "Ichthyologia Ohiensis" had often depended on memory without the check of careful notes, and in other cases had described scientifically, from the stories of others than Audubon, fishes which never existed. Eliminating these forms, which are relatively few in number, there yet remains a rather large list of fishes that well attests the accuracy of Rafinesque's observations and his power of specific diagnosis.

The "Ichthyologia Ohiensis" will therefore stand as the groundwork of the ichthyological literature of the great valley of the Mississippi, throughout which very many of the forms that it described now range.

RAFINESQUE'S WORK IN CONCHOLOGY.

Almost equally with the work accomplished among the fishes does Rafinesque's work in the molluscan group rank as fundamental. In the extensive papers published in the *Journal des Physique et Chimie*, etc., of Paris, Rafinesque for the first time called attention to the great wealth, in the western waters, of animal life in this branch of zoölogy. Not only did he discover many forms unknown to other naturalists, but he described them well. He even saw the wide

diversity that existed among the great family of the *Unionidæ* and attempted to render the group more intelligible by instituting many subdivisions. That these were always of value could not now be maintained; but later students, unwilling to institute subgenera, have found it necessary to investigate these mollusks under a natural grouping, each division of which is headed by some well-known typical form. The fact that Rafinesque actually made these divisions may well be pardoned, therefore, in the light of the great diversity of form which the Ohio *Unionidæ* present.

Rafinesque visited the Falls of the Ohio for the first time in the late summer of 1818. The water was low, as it usually is at that season, and myriads upon myriads of fresh-water univalves, of the family *Strepomatidæ*, were in the shallows and pools. The numbers of shells of this group, which may be seen in a single pool, is incredible to one who never has made a visit to the locality. They are of various and beautiful coloration or markings; to Rafinesque, who saw them for the first time, they must have had an irresistible charm. Few of the naturalists of America had seen more than the half score of species found in the eastern States; these western forms were practically unknown. They constituted the subject of extended notice in the Brussels

Annales, and so this work becomes of historic importance to the student of mollusca. Only recently there has been made an attempt to interpret Rafinesque's descriptions and figures from abundant material collected at the Falls of the Ohio, and the results appear to be commensurable with those reached by the students of the fishes. There are, indeed, the same short and often faulty diagnoses, the same disregard of formal notes that should have been made on the spot, the same crudity in generalization that affords just subject of criticism to the student of fishes. But Rafinesque's conchologic nomenclature appears to be better understood than does that of his fishes; at least this is true outside of the family of *Unionidæ*. In this connection the remark made by President Jordan, in his report on the Fishes of Ohio,* may be quoted as especially applicable to the work which Rafinesque did in the mollusca:

". . . I may say that Rafinesque's work as a whole is bad enough, and bad in a peculiarly original and exasperating way, but that it is much better than some of its critics have considered it, and that the trouble it has occasioned in nomenclature is due to a large extent to causes not inherent in the character of the work. A certain amount of conservative odium always attaches to a writer who attempts to form natural genera out of time-honored artificial combinations."

* Geological Survey of Ohio, Vol. IV, Zoölogy and Botany, p. 741, 1882.

I do not think that Rafinesque has always received fair treatment at the hands of American conchologists. He has been traduced, and in one instance, at least, a concerted attempt has been made to ignore his work and to reflect on his scientific reputation.* From these facts it has resulted that others have been influenced in forming their opinions of his work, not having the opportunity, assuming that they had the inclination, to

*My library contains a small pamphlet, with the following title: "*Catalogue | of the | Unios | Alasmodontas, and Anodontas | of the | Ohio River and its Northern Tributaries, | adopted by the | Western Academy of Natural Sciences, | of Cincinnati, January,* 1849. | *Cincinnati; | Printed by J. A. & U. P. James.* | —— | ". This small catalogue of nineteen pages recognizes sixty-seven species of these three subgenera. Of these species three of *Unio* are credited to Rafinesque; a large number of the other names which he gave to forms are listed under the synonymy of various species described by other writers, notably Say, Hildreth, Barnes, and Lea. This pamphlet had its origin in a determined attempt to recognize none of Rafinesque's species. A very interesting fact connected with its design lies in the mention of a similar matter by Dr. Lea, who says (*Synopsis of the Family Unionidæ*, 1870, p. xxx,) that the Ohio naturalists, Hildreth, Kirtland, Ward, Buchanan, and Clark, also made out a list in which they gave one species only to Rafinesque out of a total of one hundred and nineteen! It is a fact of great moment to note that possibly these gentlemen, who were interested as descriptive naturalists in this same group, may have rendered not a fair judgment. It is also important to note that Rafinesque's descriptions appear to have been drawn so accurately that these gentlemen could recognize them, and place them as synonyms under names which they and their friends had attempted to establish. It will always be considered by future students that this treatment of Rafinesque was unfair, unjustifiable, contrary to the true spirit of science, and inimicable to the best interests of knowledge. The final classification of the *Unionidæ* has yet to be made.

obtain information at first hand. Even Mr. Lea, who reviews the matter with some detail in his *Synopsis of the Family Unionidæ*, edition of 1870, does not seem to be entirely free from prejudice, notwithstanding that he declares he "studied his [Rafinesque's] works faithfully, without prejudice, and certainly without profit, losing much time ineffectually". In short, it would appear that Mr. Lea's explanation of his treatment of Rafinesque's species is less an attempt to unravel the difficulties of the matter, and do justice to all concerned, than an attempt at a justification of a method which entirely disregarded the work Rafinesque had accomplished. One can not but feel that, if more generous impulses had prevailed among the naturalists who wrote from 1825 to 1870, much of the difficulty in the way of recognition of the species established by Rafinesque and others would have been avoided. Jealousies of the most pronounced character entered into the matter, and a general wrangle ensued which eventually involved nearly all the conchologists of this country. In the discussions which resulted, Rafinesque and his views were quite lost to sight. Only of late years his claims have been advanced again. Both Mr. Say and Mr. Conrad, well known for work on the members of the family *Unionidæ*, have published lists in which some of

Rafinesque's names are made a leading term, but the unfortunate fact remains that these lists were in part the result of the antagonisms which prevailed among the earlier conchologists. Each felt, or fancied, that he had not received proper consideration at the hands of Mr. Lea, and so there resulted some forced recognitions of Rafinesque's species, in the hope that Mr. Lea's names would fall into synonymy. This very unpleasant episode in American malacology would better be passed in silence were it not that it must come into observation when the final revision of the *Unionidæ* is undertaken.

The results reached by Rafinesque in fossil conchology do not possess the value which attaches to his work in recent shells. Many of the genera characterized by him are faulty in so many particulars, and have such imperfect description, that, if quoted at all, they are relegated to tables of names of *insertæ sedis*. However, one, a very common genus, from the Devonian, known as *Strophomena*, yet remains, of all Rafinesque described, to indicate that he did some work in the brachiopoda. Among corals his Devonian genus *Zaphrentis* yet stands and represents almost the sum of his studies in the cœlenterates. The great majority of his generic and other names bestowed upon fossils at one time or another has been shown to be valueless.

In respect to land shells Rafinesque's names have fared far better. A number of his genera are still recognized, and are in common use. Since most or all of the work which he did in this branch was unique for its time, and since his aptitude for forming generic names was most happy in the matter of the choice of the terminology employed, it is with pleasure that one chronicles the fact that many yet stand in the various systems. Among them are *Triodopsis*, *Mesodon*, *Stenotrema*, and *Mesomphix*, all of which are happy expressions of conchologic facts.

Considered as a whole the conchologic work of Rafinesque was remarkably well done. The forms on which he based his nomenclature were not myths, but were actually under observation. If some of them must be abandoned, it is in keeping with the rules of priority most rigidly applied; some are names given to groups that had already been characterized, but the fact was unknown to their author. He, first among many, succeeded in regrouping, in some rational and natural manner, forms of most divergent character that before had constituted heterogeneous assemblages; he was, in this matter, far ahead of his contemporaries, and the fact must ever remain as a singular proof of his acumen.

RAFINESQUE'S WORK IN BOTANY.

One of the most striking facts in connection with the botanical work of Rafinesque consists in his constant onslaughts upon the artificial classificatory systems of his day. Especially is this marked in his reviews of the work of others. In these papers he spares not, and herein lies one chief cause of the disrepute into which he early fell among American botanists. He was bold to a fault; he was quick to see new relations; he was not always careful to work them out to the satisfaction of others, but insisted on their adoption without the formality of a rigid demonstration. In this way his propositions came to be regarded as dangerous innovations, for American science was yet under the domination of the masters in Europe. Closet naturalists abroad directed the investigators of this country what groupings to accept and what relations to recognize.

Of the genera and species established by Rafinesque, and that are recognized in Gray's Manual of Botany, there are thirteen genera, eight subgenera, and sixteen species. With advancing years others will be added, and the full sum of tardy justice eventually will be reached. There only intervenes, preventing speedy rec-

ognition, that doubtful rule that accepts a well-known and long-recognized name in lieu of one less well known but previously described. However convenient such a rule may be to the systematist in botany, it is manifestly one which is capable of being applied with great injustice.

THE FLORULA LUDOVICIANA.

This work, on account of its remarkable nature, and because it has justly subjected its author to severest censure, deserves more than passing notice. Like very many others of the works of Rafinesque, this one has a piece-meal *ensemble* that is quite characteristic. It is "respectfully inscribed to Dewitt Clinton, LL. D., Governor of the State of New York, President of the Literary and Philosophical Society of New York, and president of many other learned and benevolent societies, etc., etc." A preamble of five pages states the sources of information for the matter contained and the reasons for publishing the work. The justification for the book, in Rafinesque's mind, may be found in the following statement from the preamble:

" . . . In perusing this Flora, I was astonished to find, among many blunders in nomenclature and classification, several accurate descriptions and valuable additions to the knowledge of plants, their geography, utility and natural history. Having, therefore, compared with attention all his descriptions with the Floras of North

valuable work; but had he even had a knowledge of it, it is probable that the circumstances of its being written in French, classed naturally, and often destitute of accurate botanical names, would have been considered by him as sufficient grounds for his neglect, since he has been pleased to neglect other descriptions of plants wrote in English and well named.

Considering, therefore, that a revisal and translation of Robin's Flora, might be a desirable addition to Pursh's Flora, and our knowledge of North American Botany, I have undertaken this task, which has, in many instances, proved an arduous one, owing to the numerous misnames and errors of the author, who does not appear to have been a professed Botanist, but a mere observer and collector; his observations and descriptions are, however, generally accurate, which is proved by his descriptions of well known plants. I have preserved, throughout, the classification of Jussieu, adopted by Robin, and the order in which he has enumerated his plants, adding merely numbers to each; this conformity has appeared to me desirable, in order to facilitate a comparison of our different labours, and to show at once many of Robin's mistakes: I was, however, inclined to change the whole classification of this Flora, and adopt my improved natural arrangement, but as this would have overset altogether the plan of Robin, I was induced to prefer the actual order.

The nomenclature of the whole Flora has been new modelled and accurately fixed, so far as Robin's descriptions would allow; for in some instances he has not described the plants he mentions, and in some

others his descriptions are too short, or not characteristic; it was then merely by presumption, and with doubt, that the real names could be stated. The names of Robin are always added in synonimy, and with reference to the page in his Flora, or third volume of his travels.

To each specie, all the interesting particulars mentioned by Robin are added; likewise, such parts of his descriptions as are not found in Michaux and Pursh. When the species are new, a botanical name is given to each, which is followed by a Latin specific definition or diagnosis, and a translation of the whole of Robin's observations, on the plan of Pursh's Flora.

New genera have been properly named and characterized by generic denominations and definitions, to which appropriate observations on their natural affinities are added, together with the etymology of their name. It may not be amiss to observe, that although Robin has, in a few instances, mentioned that the plants he describes appeared to be new genera or species, he has in no instance given them proper Botanical names.

The result of this labour consists in the enumeration of more than 400 species, whereof 196 are new, and in the introduction of 30 new genera, besides several, such as *Aretia*, *Peucedanum*, *Acanthus*, *Lantana*, *Chrysophyllum*, *&c.* which had not yet been introduced in the North-American Flora. Among the 196 new species, are to be reckoned 15 new trees of the genera *Celtis*, *Laurus*, *Tilia*, *Fraxinus*, *Ulmus*, *Gleditschia*, *Hicorius*, *Chimanthus*, *&c.* and 18 shrubs, principally of the genera *Arbutus*, *Chrysophyllum*, *Prunus*,

FROM RAFINESQUE'S "FLORULA LUDOVICIANA."

America of Michaux and Pursh, I became convinced that a great number of new genera and species, unknown to those authors, were described by Robin."*

That any marked scientific value could attach to a volume prepared as Rafinesque arranged this one is impossible. That part of the "Florula Ludoviciana" which is thus based upon Robin's work comprises pages 12 to 128. To this part of the book there are three indices; the first, an "Index of Louisianian vulgar names", all of which are, naturally, French; second, an "Index of New Genera and Sub-Genera"; and lastly, an "Index of Old Genera". Pages 129–155 are devoted to a "Supplement" and "Additions" based upon the works of Pursh, Bartram, Michaux, and others; this is designed to include all the plants unknown to Robin, which were mentioned by these authors. Not the least remarkable feature of the book is that portion which fills pages 157–165, and is occupied with "An Appendix to the Trees and Shrubs of Louisiana" based upon an entirely different publication than Robin's. This work was by William Darby,† and has, in a chapter on statistics,

*The title of Robin's book is as follows: Voyages dans l'interieur de la Louisiane, de la Floride Occidentale, et dans les isles de la Martinique et de Saint-Dominque, pendant les Années 1802, 1803, 1804, 1805 et 1806. Paris. 1807. (3 Vols., 8vo.) The botanical portion is the "Flore Louisianaise", Vol. III, pp. 313–551.

†A | Geographical Description | of the | State of Louisiana, | the Southern part of the | State of Mississippi | and | Territory of Alabama: | presenting | A

many references to the indigenous forest trees of various parts of the State. On pages 300, 301, and 353–356 are two formal lists, with both English and Latin names, of trees that form the basis of the supplement of Rafinesque in his Florula. The last few pages of Rafinesque's book are concerned with advertisements of his books and papers already published, and to be published, as well as mention of some still in hand. Taken altogether the volume is a most curious botanical *olla podrida*.

The descriptions of Robin, as he himself states, were all based upon the living plants; he made no collections; nor were his notes submitted to any competent botanist. That he actually saw the plants he indicates, and to which he gave the French provincial names, is without question the fact, but he nowhere describes these plants technically. Nor is it at all likely that he possessed the ability to do so. The Latin diagnoses of Rafinesque, therefore, must be regarded as pure fabri-

view of the soil, climate, animal, vegetable, and mineral | productions: illustrative of their natural physiognomy, | their geographical configuration, and relative situations; | with an account of the character and manners of the | inhabitants. | Together with | A Map, | from actual Survey and Observation, projected on a scale of | ten miles to an inch, of | The State of Louisiana, | and adjacent countries. | —— | Second Edition, enlarged and improved. | —— | By William Darby. | —— | [Extract of five lines, in French, from the *Memoire de M. De Vergennes sur la Louisiane.*] | —— | New York. | Published by James Olmstead, | Sold also by B. Levy & Co. Booksellers, New Orleans. | J. Seymour, printer. | —— | 1817. [8vo., map, pp. I–XII (1, Map) 13–356. (3).]

cations which have neither scientific value nor authority. His book takes its proper place as a literary curiosity; it will, at the same time, remain a monument to the most foolish episode in his botanical career.

OTHER BOTANICAL WORK.

The penchant for genus-making, which was so marked in Rafinesque, seems to have had full swing in his botanical nomenclature. Not only did he emphasize minor differences, but he even closely scanned the descriptions of others, and, without seeing the plants themselves, erected on these formal written or printed diagnoses his own generic names. That he was often wrong could be said with truth; but that he was often right is equally true. He had little sympathy with the artificial systems that prevailed during the early part of the century. He saw relationships that others were unwilling to grant him. In his reviews of the published work of other authors he employed his characteristic methods to an alarming extent; some of the genera which observers proposed he threw out of his system, on the ground that he had himself originally described them under other names. That this method should bring upon him the severe criticisms of those whose work he treated thus is by no means surprising, but his

rejoinders were not always of a courteous nature. On this matter Doctor Gray, reviewing Rafinesque's botanical writings, in 1841, wrote as follows:

"It is indeed a subject of regret, that the courtesy which prevails among the botanists of the present day, (who are careful to adopt the names proposed by those who even suggest a new genus,) was not more usual with us some twenty years ago. Many of Rafinesque's names should have been adopted; some as matter of courtesy, and others in accordance with strict rule. But it must be remembered, that the rule of priority in publication was not then universally recognized among botanists, at least as in present practice, (the prevalence of which is chiefly to be ascribed to the influence of De Candolle;) the older name being preferred *cæteris paribus*, but not otherwise. It is also true, that many scattered papers of Rafinesque were overlooked by those who would have been fully disposed to do justice to his labors, had they been acquainted with them; and a large portion of the genera proposed in his reviews of *Pursh*, *Nuttall*, *Bigelow*, &c., were founded on their characters of plants which were doubtfully referred to the genera in which they were placed, or were stated to disagree in some particular from the other species."*

There is opportunity for some careful botanical student permanently to place the Rafinesquian genera into their true relation to the work of others. Whether the results will be largely valuable does not matter; it has now become a simple question of priority and of justice. The work of a man who has been grossly neglected will

*American Journal Science, Vol. XL, p. 234, 1841.

need to be carefully revised; many of his dried specimens and illustrations of genera still are to be found in the herbaria of Europe and America. The task will be less difficult in this than in any other branch which Rafinesque cultivated, for he was first of all other things a botanist, and accomplished in that subject his most valuable work. In other directions little or nothing anywhere remains to help the student of science in forming a judgment. The best collection which illustrated his work in the *Unionidæ*, that of Mr. C. A. Poulson, of Philadelphia, has been scattered long since, and there exists no other which would have given the aid possible in that one. But many dried plants with original Rafinesquian names still exist, and these should be examined; then should the rules of priority rigidly be enforced.

Rafinesque's botanical work extended over the whole period of his literary activity. A large number of short papers appeared from time to time, in every possible medium of publication. These never were collected by their author, and there exists to-day no complete collation in any library in the world. Some of the work he did on Kentucky plants was not published under his name, though the most of that work found its way to the scientific public through a variety

of avenues. The single exception, which is important, is the first, or almost the first, list of Kentucky plants, published by Doctor Henry McMurtrie, in his "Sketches of Louisville", in 1819.* This volume contains an appendix called "*The Florula Louisvillensis sive Plantarum Catalogus vicinitate urbis, Henrico M'Murtrie, M. D.*," and comprises pages 207–230. The name of Rafinesque nowhere is mentioned in connection with this catalogue, though he was credited with lists of the shell-fish and the fishes given on pages 62–66. But a writer in the *Western Review and Miscellaneous Magazine*, Volume II, page 90, speaking of the list of plants as "a pretended view of the vegetables of that section of the country", states that McMurtrie was indebted to Rafinesque for the names and classification of his plant list! Certain it is that the list contains some of the Rafinesquian genera, and thus shows some acquaintance with Rafinesque's work on Kentucky plants, very little of which had been published at that date.

* Sketches | of | Louisville | and its Environs; | including among a great variety of Miscellaneous Matter, a | Florula Louisvillensis; | or, A Catalogue of | nearly 400 genera and 600 species of Plants, that grow in the vicinity of | the Town, exhibiting their Generic, Specific and | Vulgar English Names. | By H. McMurtrie, M. D., etc. | . . . | —— | To Which is Added | an appendix, | Containing an accurate Account of the Earthquakes experienced here from | the 16th December, 1811, to the 7th February, 1812, extracted prin- | cipally from the Papers of the late J. Brookes, Esq., | —— | First Edition. | —— | Louisville, | Printed by S. Penn, prin. Main-Street | 1819.

Among the best of the drawings which Rafinesque made of plants, usually in outline only, were those of his earliest attempts essayed while still a resident of Sicily. These plates were all lost in the shipwreck, only one ever appearing. There exists in the library of the New York Academy of Science, in a volume of botanical wood-cuts,* a collection of plates by Rafinesque. On the margin of the first plate is written: "The following are the proofs of plates lost in my shipwreck of 1815." On the back is written: "Collection of 29 plates and 46 figures of New Genera and Species of plants from N. America, discovered by C. S. Rafinesque in 1802–1804. Published in 1807, 1808, and 1814. These plates never published—only proofs of plates lost in 1815, thus they are a unique collection. Deposited in the Lyceum at the foundation in 1817, by the author. N. B. The Phyllepidum alone was published in the Encycl. Journal of Sicily, 1814." Whether these plates and figures will serve to distinguish the American plants described as a result of the first visit to the United States must be left to the professional botanists to determine.

Rafinesque's drawings of plants were all, so far as we have seen them, in outline. Perhaps the best

* Volume C, Shelf D, Case No. 36.

examples are to be seen in the Medical Flora, the one hundred plates of which are all in outline, but are very characteristic and accurate. The plants are easily recognizable from the drawings, but are deficient in matters of detail. None of the drawings made by him to illustrate zoölogical subjects at all approach these plates of plants in accuracy and value. In short, however, Rafinesque could not be said to have made even clever drawings of the plants which he named and described. His reputation as an artist rests on a very insecure foundation.*

Summarizing the facts in the botanical writings of Rafinesque, it would appear that he, among the first, clearly saw that many plants, which had been forced into specific and generic relationship, were really either separate forms or types of new genera; that his opportunities for wide collection rendered it clear that new groupings must be made, though in this he antagonized the workers of his time. It also appears that foreign authors and collectors frequently found plants with the generic relationships of which they were not themselves

*Very few of Rafinesque's general drawings have been preserved. An interesting instance, however, may be seen in the *Medical Repository*, Vol. XVIII, in a letter by a Mr. Gratz, one of the former owners of Mammoth Cave, relating to a mummy said to have been found in the Cave; the drawing from which the engraving was made was by Rafinesque.

entirely satisfied; in their various systematic arrangements these aberrant forms were noted, of course. These plants of *insertæ sedis* Rafinesque assumed to group, and he established for them new generic appellations. In the great majority of instances he never saw the plants themselves when he thus attempted to establish a new genus, but based his work on the descriptions of the students from whom he borrowed. It also appears, whether from ignorance or from indifference does not here matter, that he gave names to plants already well known, thus needlessly complicating the literature of botany. These are his chief defects. On the other hand there is to be considered an insight into natural groupings which was far ahead of that of others of his time; a love for Nature that amounted to a passion; a generosity in the distribution of his plants and his papers that few have emulated; a laudable ambition to be regarded the first naturalist of his time. These are all commendable. It is sad to reflect that the high ideals, which he had before him in early manhood, were fated to non-realization. His botanical work demonstrates that he was the creature of an unfortunate environment, the victim of an unbalanced training, the intellectual scientific problem of his day.

ARCHÆOLOGIC WORK.

During the period of Lexington residence Rafinesque devoted much attention to the mounds and other evidences of prehistoric peoples in the Ohio Valley. About Lexington, in Fayette County, are several examples of mounds, to the study of which he gave much time. It is not known that the modern methods of careful exploitation were employed by him; probably he simply surveyed and located the mounds he discovered. His attention had been directed to these interesting and remarkable earthworks during a journey in Ohio, where for the first time he saw them. From that time on, wherever he went, his close attention was directed to these objects. In the appendix to his work on the "Ancient Monuments of Kentucky", published in Marshall's History, is an enumeration of the sites of ancient towns and prehistoric monuments and similar works. In a summary, at the end of the enumeration, Rafinesque states that he had already, in North America, ascertained five hundred and forty-one sites of towns, of which one hundred and forty-eight were in Kentucky. In the same summary he says that before his time only twenty-five sites and one hundred monuments

were known in Kentucky; he then states that by his labors the entire list for North America had been increased to one thousand eight hundred and thirty, of which five hundred and five are in Kentucky. Many of these most certainly were not artificial constructions; some were the residual products of erosion; in short, they were natural features.

Very little of the work which Rafinesque professed to have accomplished in this branch of inquiry was ever printed. Such memoirs as he did present, and which are listed in the bibliography accompanying this sketch, possess but very little value. Indeed, the whole subject has practically been developed since his day. Then, too, the various earthworks were in process of exact location and of description from the standpoint of the curious; it has remained for a later coterie of students to approach the question along lines which are purely scientific. There is every reason also for believing that many of the mounds, which Rafinesque listed elsewhere than in Kentucky, were natural elevations rather than artificial works. There is no record that he ever opened a single one of them, or ever dreamed that this method alone could produce such valuable results as are now known to attach to it. Such of these mounds as can unequivocally be classed among artificial earthworks are

probably few; of the whole number but forty-one are credited to Rafinesque by Professor Cyrus Thomas,* and some of these are probably listed twice, inasmuch as the boundary lines of certain counties have changed since the original enumeration by Rafinesque, and this has resulted in some confusion regarding identity. It is, however, exceedingly creditable to his acumen and general interest in whatever had a scientific facies, that he, at that early day, should have made a list of works of this sort and thought them worthy of permanent record. Some of them he mapped or surveyed, making copious notes at the time. These facts, thus gathered, have been utilized by subsequent writers.

In Squier and Davis' "Ancient Monuments of the Mississippi Valley"† are a number of plates of mounds and other earthworks derived from the unpublished manuscripts of Rafinesque. On page xxxvi of the

**Vide* Catalogue of Prehistoric Works east of the Rocky Mountains. pp. 89–102. Bureau of Ethnology, Washington. 1891.

†Smithsonian Contributions to Knowledge, Vol. I, 1848. The following plates in this work are based upon the surveys and drawings of Rafinesque: Plate IX, No. 3, Ancient Work near Lexington, Kentucky; Plate XII, No. 1, Stone Work on Duck River, Tennessee; Plate XIII, No. 1, Works on Flat Run, Bourbon County, Kentucky; Plate XIV, No. 3, Ancient Work, Fayette County, Kentucky; Plate XXXVIII, Ancient Work on the Etowah River, Alabama (Georgia?); Plate XXXII, No. 6, Ancient Work, Montgomery County, Kentucky; Plate XXXIII, No. 1, Ancient Work near Mount Sterling, Kentucky, on Brush Creek, Montgomery County.

preface of that rare and valuable volume may be noted the following remark:

"It will be observed that several plans and notices of ancient works are presented in the succeeding chapters, upon the authority of the late Prof. C. S. Rafinesque. This gentleman, while living, devoted considerable attention to the antiquities of the Mississippi valley, and published several brief papers relating to them. His notes and plans, for the most part brief, crude, and imperfect, at his death found their way into the possession of Brantz Mayer, Esqr., of Baltimore, late Secretary of the American Legation to Mexico. . . . His notes are principally important, as indicating the localities of many interesting monuments, rather than as conveying any satisfactory information concerning them."

It is difficult properly to characterize this critique of the work of Rafinesque without doing an unintentional injustice to the memory of the distinguished authors of the "Ancient Monuments," but it hardly appears to do Rafinesque full justice. It does not recognize the fact of his inexperience in studies of this character, nor does it consider that this branch of investigation was very far from being reduced to a scientific method in his day. It fails to measure his work by the standards of his time and the status of his subject, but applies modern methods of criticism. His notes may have been brief, his work crude, his deductions not always sound, his information not always complete; granted all these, yet time has shown the essential accu-

racy of his facts, time has developed value for these observations, if they only have served to indicate to more observing minds and to more skillful surveyors the locations of new and important prehistoric works.

With the location of certain now well-known ancient monuments, and with their fair delineation, the really valuable portion of Rafinesque's archæologic work may be said to end. The extensive memoirs which he projected, and some of which he partially executed and published, possess very little archæologic value indeed. It is quite clear that Rafinesque was not well equipped for investigations of this sort. The opportunity to let the imagination run riot, because there is so little check of real fact in certain lines of ethnologic investigation, afforded to him the means of attempting some of the wildest vagaries. His ideas were not checked by facts but proceeded along lines which were impossible of demonstration. It would be hard to find a more valueless and unscientific treatment of ethnologic questions than that in his "Ancient Annals of Kentucky", in Marshall's History, or those found in his "American Nations etc", if, indeed, one except the works of John Haywood and Josiah Priest! One of the shorter papers of Rafinesque, published in the *Cincinnati Literary Gazette*, the "Biography of the American Solomon",* called forth a severe

*The *Cincinnati Literary Gazette*, No. 22, May 29, p. 170, 1824.

critique from David G. Burnett, some time president of the Lone Star State, who also furnished the *Gazette* a series of articles on the Indians of Texas. Perhaps it would be quite sufficient to say, in brief, that the work done by Rafinesque in this field possesses so few of the elements of permanency and of value that it can not be quoted as authoritative nor depended upon as exact by any modern author. His claim to scientific recognition would surely fail if it rested on his archæologic work.

Literary Work from 1825 to 1840.

When Rafinesque left Kentucky, in the fall of 1825, the period of his most valuable scientific work came to an end. From that time his literary efforts partake more and more of the character of vagaries. His life now became a series of disappointments and constant struggles with poverty. Every man's hand appeared to him to be against him; a certain misanthropy, which had developed, became very marked and dominated all his work. If he failed in any enterprise his "secret foes" accomplished it; if his books were not issued to him fresh from the press without payment, and were therefore held back, it was "the secret machinations of enemies"

that accomplished it. In such frame of mind as this Rafinesque passed the last fifteen years of his life, and under such an incubus of distrust did he prepare and print his later works. It is little wonder, therefore, that they are now sought after, not for any scientific value which they may possess, but for the fact that they are really literary curiosities. One alone of all his works, published during those fifteen years, has in it the elements of perpetuity, and that is the "Medical Flora". This work of two volumes possesses real value, and stands as his best monument for all this period. His literary work was never entirely abandoned, though it was seriously interfered with by business ventures of one or another sort; with these were entangled several patent schemes relating to steam-plows, incombustible dwellings, sub-marine steamboats, and the like, which, of late years, have been realized by other and competent inventors.

What the real nature of the literary work of this period was, a glance at the appended bibliography will disclose. It covered the usual wide scope of subjects, and was characterized by the usual looseness of style and piece-meal *ensemble*. Perhaps the best illustration of the valueless work of this latest period is "*The Genius and Spirit of the Hebrew Bible*", a book without a single redeeming literary feature.

The botanical work of Rafinesque, during this last period, was mainly in the establishment of various new genera of plants, a large number of which were proposed. He had planned a thousand new ones, as he announces in his *Flora Telluriana*, but most of them were based upon the work of others, and not on the plants themselves. Many short papers, proposing new species of plants, or erecting new genera, appeared from time to time, but always in cheap and ephemeral form. His articles were usually short, and poorly written; he had lost the facile pen of his earlier life. He yet traveled everywhere, and yet collected largely of every thing that grew. He yet kept note-books, yet planned stupendous literary undertakings. Nothing appeared long to receive his undivided attention. He abandoned a subject after brief treatment, only to take it up again and complete his observations thereon at another time. Attempting every phase of human thought, writing on almost every subject known to men, planning but never executing, undertaking only to abandon, distrustful always, ever indefatigable, living only to publish, withholding money from necessities that he might present to the world of scholars some new book or pamphlet, what wonder that the literary efforts of this period are estimated to be of so little value!

Rafinesque's Literary Style.

The reader of Rafinesque will find few attempts at rhetorical effect. His style is singularly loose and unscientific. His thought is not always sequential; his facts are not always clearly presented. There are frequent lapses from grammatical laws, seen particularly in the relation of singular verbs and plural subjects, or the contrary. When he essayed formal description in natural history Latin, the ablative absolute and the nominative independent are hopelessly confused. And yet, notwithstanding these defects in style, there is a certain directness and vigor which are refreshing. Especially is this true of those parts of his writings which may be regarded as controversial. His printed works abound in contractions, but most often of the two words genus and species; he commonly wrote "G." for the one, and "Sp." for the other. Rarely did he spell his numerals, but usually employed the Arabic symbols. These facts give to his pages a peculiar appearance, and may be regarded as distinctive.

To enable the reader to form some fair opinion of Rafinesque's best literary style the following extracts, from the "New Flora of North America," Part I, Introduction,

are given at some length. Doctor Asa Gray, who also quotes them, does so with the remark that in them Rafinesque "draws a lively picture of the discomforts, as well as the enjoyments of a travelling naturalist". They certainly are both vivid and true to nature:

"During so many years of active and arduous explorations, I have met of course all kinds of adventures, fares and treatment. I have been welcomed under the hospitable roof of friends of knowledge and enterprise, else laughed at as a mad botanist by scornful ignorance.— Such a life of travels and exertions has its pleasures and its pains, its sudden delights and deep joys mixed with dangers, trials, difficulties and troubles. No one could better paint them than myself, who has experienced them all. Let the practical botanist, who wishes like myself to be a pioneer of science, and to increase the knowledge of plants, be fully prepared to meet dangers of all sorts in the wild groves and mountains of America. The mere fatigue of a pedestrian journey is nothing compared to the gloom of solitary forests, when not a human being is met for many miles, and if met he may be mistrusted; when the food and collections must be carried in your pocket or knapsack from day to day; when the fare is not only scanty but sometimes worse; when you must live on corn bread and salt pork, be burned and steamed by a hot sun at noon, or drenched by rain, even with an umbrella in hand, as I always had. Musquitoes and flies will often annoy you or suck your blood if you stop or leave a hurried step. Gnats dance before the eyes, and often fall in unless you shut them; insects creep on you and into your ears. Ants crawl on you whenever you rest on the ground, wasps will assail you like furies if you touch their nests. But ticks, the worst of all, are unavoidable whenever you go among bushes, and stick to you in crowds, filling

your skin with pimples and sores. Spiders, gallineps, horse-flies, and other obnoxious insects, will often beset you, or sorely hurt you. Hateful snakes are met, and if poisonous are very dangerous; some do not warn you off like the Rattle-snakes. You meet rough or muddy roads to vex you, and blind paths to perplex you, rocks, mountains, and steep ascents. You may often lose your way, and must always have a compass with you as I had. You may be lamed in climbing rocks for plants, or break your limbs by a fall. You must cross and wade through brooks, creeks, rivers and swamps. In deep fords or in swift streams you may lose your footing and be drowned. You may be overtaken by a storm; the trees fall around you, the thunder roars and strikes before you. The winds may annoy you; the fire of heaven or of men sets fire to the grass or the forest, and you may be surrounded by it unless you fly for your life."*

But the true botanist and the student and lover of Nature has the ascendancy in the end; that Rafinesque felt this, and that he had often realized it is very clear from his description of the counterpart of the toils and dangers just enumerated. Says he:†

"The pleasures of a botanical exploration fully compensate for these miseries and dangers; else no one would be a travelling botanist, nor spend his time and money in vain. Many fair days and fair roads are met with, a clear sky or a bracing breeze inspires delight and ease, you breathe the pure air of the country, every rill and brook offers a draught of limpid fluid. What delight to meet with a spring, after a thirsty walk, or a bowl of cool milk out

*New Flora of North America, Part I, Introduction, p. 11, *et seq.*

†*Ibidem*, p. 14, *et seq.* Quoted from Gray in American Journal of Science, Vol. XL, 1841, pp. 223, 224.

of the dairy! What sound sleep at night after a long day's walk; what soothing naps at noon under a shaded tree near a purling brook. Every step taken into the fields, groves and hills, appears to afford new enjoyments. Landscapes and plants jointly meet in your sight. Here is an old acquaintance seen again; there a novelty, a rare plant, perhaps a new one, greets your view; you hasten to pluck it, examine it, admire, and put it in your book. Then you walk on thinking what it might be, or may be made by you hereafter. You feel an exultation, you are a conquerer, you have made a conquest over Nature, you are going to add a new object or a page to science.—To these botanical pleasures may be added the anticipation of the future names, places, uses, history, &c. of the plants you discover. For the winter, or season of rest, are reserved the sedentary pleasures of comparing, studying, naming, describing, and publishing."

There are occasional idioms in his composition, and these are constant reminders of foreign parentage and education, yet occurring often enough to cause us to be patient with the grammatical faults of Rafinesque. On the whole his English is very good; but the brevity of his descriptive work renders strict compliance with established usage quite impossible. The chief fault in his scientific writings consists in extreme brevity of description; evidently his original descriptions were hastily drawn, many or most of them in the field, and these formed the bases of his future published work. In this way may be explained very many crudities; they are *verbatim* renditions of original field notes.

The writings of Rafinesque should be regarded from the literary standpoint of his time, in the field which he cultivated. Natural history was not then the important branch of culture it is now; it was not cultivated by men of classical training, or but rarely so; the men who worked at natural history problems did not always possess the advantage of the drill and refinement then supposed to pertain solely to the languages. If these facts be remembered the judgments formed concerning the style of Rafinesque will be generously modified; final opinions will on the whole prove to be quite complimentary.

Rafinesque and Evolution.

The wide acquaintance of Rafinesque with the physical conditions under which plants grow, and with the evident relationships which exist between physical factors and the forms of plant life, seems to have resulted in some views concerning species, varieties, and so on, that entitle him to distinction as an evolutionist. It is not meant by this that he had a carefully formulated system of evolutionary development in mind; it is intended to be understood as implying that he did, however, clearly see one of the important factors in that far-reaching philosophic doctrine. From an early period

in his study of natural forms he had conceived certain opinions regarding the natural relationships of so-called species and varieties; these he first expressed, though in very crude form, in 1814, in his work on Somiology. Toward the latter part of his life he appears to have arrived more definitely at that form of evolution which may be said to find its best illustration in Lamarck. He had not, apparently, thought out any connected philosophic system of development; he had caught only a glimpse of the great truth. Nor do his expressions of his views bear evidence of having investigated, closely and continuously, the problems only the outlines of which he saw before him. Perhaps, allowing him to speak for himself, it is better that one suppose him a Lamarckian rather than a Darwinian. Darwin's great work was in progress, and had been for many years, though unknown to Rafinesque when he wrote,* in 1833, as follows:

"I shall soon come out with my avowed principles about G. and Sp. partly announced in 1814 in my principles of Somiology, and which my experience and researches have ever since confirmed. The truth is that Species and perhaps Genera also, are forming in organized beings by gradual deviations of shapes, forms and organs, taking place in the lapse of time. There is a tendency to deviations and mutations through plants and animals by gradual

**Vide* Herbarium Rafinesquianum, p. 11 and p. 15. 1833.

steps at remote irregular periods. This is a part of the great universal law of perpetual mutability in everything.

"Thus it is needless to dispute and differ about new G., Sp. and varieties. Every variety is a deviation which becomes a sp. as soon as it is permanent by reproduction. Deviations in essential organs may thus gradually become N. G. Yet every deviation in form ought to have a peculiar name; it is better to have only a generic and specific name for it, than 4 when deemed a variety."

These opinions appear to us to warrant the assertion that Rafinesque was an evolutionist. This is a remarkable fact for his time, when nearly the whole world of science yet maintained the fixity of species and the immutability of genera; a time when those purely artificial yet convenient divisions of the student of living forms, unknown to Nature itself, called genera, were thought to be the result of express creative fiat. While Rafinesque's belief appears to result from actual observation of botanical facts, he had nowhere elaborated his views, nowhere presented them as a complete system, nowhere given evidence that he was capable so to do. It rather would seem to be a kind of happy inspiration, such as sometimes come to men, that guided him in his groping search. It may be that this thought was uppermost in his mind when he described so many new forms on slight data; if they were not yet species they surely would be such in time!

Medals, Diplomas, and Other Honors.

The scientific work of Rafinesque earned for him recognition from many learned societies. Among them were the Academies of Science of Zurich, Vienna, and Bruxelles; the Reale Accademia delle Scienze, e Belle Lettere, Naples; Société de Geographie, Paris; the Lyceum of Natural History, New York; the Literary and Philosophical Society, New York; the Medical Society of Lexington, Kentucky; the Medical Society of Cincinnati, Ohio; and other lesser organizations. The earliest one of these to confer membership, or a diploma, on him was the Natura Curiosorum, of Bonn. Rafinesque says that this society conferred on him the degree of Doctor Catesby, *i. e.*, named him to fill the position styled for, or in honor of, that celebrated traveler.* The Société de Geographie gave him its gold medal, in 1832, for two memoirs on "The Primitive Negroes of Asia and North America", but these essays were never published.†

*This was Mark Catesby, English naturalist, born about 1680, died in 1749. He was the author of an early work on the zoölogy of America, published under the title, "The Natural History of Carolina, Florida and the Bahama Islands, &c." London, 1731–1743.

†The present whereabouts of this medal is unknown. In 1876 it was in possession of Doctor William Kent Gilbert, of Philadelphia. An illustration of it may be seen on page 99 of *Potter's American Monthly*, Vol. VI, No. 50,

Transylvania University conferred on him the degree of Master of Arts, July 10, 1822.* He had been elected to membership in the Philadelphia Academy of Sciences in February, 1816. His membership in the New York Lyceum of Natural History dated from the time of organization, he having been one of its founders.

Notwithstanding the fact that formerly, more than now, it was customary to bestow honors of this sort on learned men without the very close scrutiny which now obtains, it must be clear that the early scientific work and acquaintance of Rafinesque had gained for him substantial reputation. These societies all would not have given him an election or other distinction without at least some examination into his claims. That they gave the honors is some evidence of deserving merit.

1876. It has been erroneously stated that this medal was sold for old gold to the United States Mint, at Philadelphia. This inaccurate statement may be based upon the fact that at the auction sale, or private sale, of Rafinesque's effects the medal was "valued at the United States Mint", but was not sold to it. From the will of Rafinesque it will be seen that he highly prized it, and had hoped it would remain in possession of the family Rafinesque.

*This fact is gleaned from the *Kentucky Reporter*, of July 15, 1822. This was a newspaper published at Lexington, files of which were examined through the courtesy of Colonel Reuben T. Durrett, of Louisville. It may be interesting to know that several other persons received this degree at the same time, to wit: Robert Jefferson Breckinridge, a graduate of Union College; William Gibbs Hunt, a graduate of Harvard University; John Thomas Mason, a graduate of William and Mary College; Robert R. Barr, James G. Trotten, and John M. McCalla, alumni of Transylvania University.

Rafinesque's Name in Nomenclature.

It is often customary for scientific investigators to compliment other students by affixing their names as specific ones in the description of plants or animals belonging to the groups which they have especially cultivated. More rarely now than formerly is this done. While no attempt has been made to collate all the forms named after Rafinesque, but very few have been found which have been so characterized. Englemann named a cactus for him—the *Opuntia rafinesquii.* A single genus of fossils has likewise received his name—the *Rafinesquiana* of Hall, for a group of Brachiopoda found in the Upper Silurian. A single Devonian coral has been named after him, the *Zaphrentis rafinesquii* Davis. Among fishes there was the name *Scaphirhynchus rafinesquii* Heckel; though described in 1835 this form is now known by the name of *Scaphirhynchus platirhynchus* Baird, described in 1850. For what sufficient reason the name was changed we have been unable to discover. In conchology Rafinesque's name has yet to appear in specific application. Not more than two or three other instances of its use would probably occur on careful search.

It is certainly not due to any fault of Rafinesque that he obtained but little recognition in the adoption of his personal name in botanical literature. At least twice he himself sought to establish the genus *Rafinesquia;* the first instance occurring when he appropriated the *Lotus pinnatus* as the type of a new genus—*Rafinesquia*, but the plant was later found to be a true *Hosackia*. The next plant selected was *Gardoquia hookeri*, which he also named *Rafinesquia*. The first instance was based on *Lotus Pinnatus* of Hooker, *Botanical Magazine*, t. 2913. This he called *Rafinesquia* (or *Flundula*) *comosa*. The description thereof may be seen in the *Flora telluriana*, 2, 96; it is now known as *Hosackia bicolor*. The second case was based upon the beautiful genus of labiate plants so well developed in the mountain region of Chili and Peru. This plant was selected after the first one employed had been shown to be well known; along with its description occurs an amusing defense of his attempt to fix his own name in nomenclature.*

The *Rafinesquia* recognized by the present generation of botanists is a genus of *Compositæ*, and includes but two known species, the *Rafinesquia californica* and *Rafinesquia neo-mexicana;* this genus, of small geographic distribution, occurs only in the southwestern United States.

**Vide* Flora Telluriana, Pt. III, p. 6, 1836.

BIBLIOGRAPHY.

Bibliography.

THE simplest arrangement, that of chronologic sequence, has been adopted in this register of titles by Rafinesque. No attempt has been made to apply rigid bibliographic rules; but the ends of lines in book-titles are indicated by light, vertical lines; magazines and journals are indicated by italicized titles; volume and page references and title verbiage have been compared, in large part, in galley-proof, with the original sources.

In all cases the mistakes and misprints of the originals, together with all lapses from grammatical correctness, have been retained. Also, many matters ordinarily deemed of small or of no importance, such as quotations and verses on title-pages, have been reproduced. The object has been to present such a faithful transcript of the title-pages that the reader might catch and study all peculiarities in style or in expression, and from the physiognomy of various title-pages be enabled to reach conclusions that would be, in a measure, original. Throughout are occasional notes calling attention to

certain facts or factors that have been deemed of use to accomplish the same result. It is hoped that this list, which has been somewhat carefully prepared, will prove useful to men of science who are interested in the historical phase of their special subjects.

Those who are somewhat familiar with the writings of Rafinesque will not find, in this bibliography, certain titles which are quoted by him in one or another of his papers, and which they must have noticed. It appears to have been a custom with him to prepare formal papers and forward them to journals, magazines, and societies; this constituted "publication" in his conception, and some of these memoirs and essays are quoted by him as having appeared. It is often quite difficult indeed to separate these titles from those which really were printed; but where specific journals are mentioned by him it is quite easy to make the discrimination. A case in point is a paper on "The Chinese Nations", said by Rafinesque to have been published in the *Knickerbocker Magazine* for 1834. The article never appeared. Similar instances might be multiplied; it is only necessary that extreme care be employed lest these fictitious works and titles shall mislead others who may desire a more intimate personal acquaintance with the late epoch of Rafinesque's literary career, the period of vagaries.

1. **Notice sur deux nouvelles especes des genres *picoides* et *turnix* de l'île | de Java, décrites à Philadelphie, dans le cabinet de** M. Peales | par le C. Rafinesque. (*Bulletin des Sciences*, | par la *Société Philomatique*, | Paris, Vendémiaire, an 11 de la République. No. 67, p. 146.) [1803.]

This constitutes the earliest title by Rafinesque concerning which I am able to give any definite information. The *Bulletin* was published in Paris, from 1791 to 1805.

2. Notice sur une hirondelle et un figuier de l'île de Java, décrits à Philadelphie, dans le muséum de M. Peales, par le C. Rafinesque. (*Bulletin des Sciences*, | par la *Société Philomatique*. | Paris, Brumaire, an 11 de la République. No. 68, p. 153.) [1803.]

3. Canvass-Back Duck and its Food. Extract of a Letter from Mr. C. S. Rafinesque to Dr. Mitchill, dated Philadelphia, Sept. 7, 1804. (In *Medical Repository*, 2d Hexade, Vol. II (No. 2), p. 208. New York, 1804.)

4. Additions to Michaux's Flora of North-America. In a Letter from Mr. Rafinesque, to Dr. Mitchill, dated Palermo, in Sicily, 8th August, 1805. (In *Medical Repository*, 2d Hexade, Vol. III, pp. 422, 423. New York, 1806.)

5. Sicilian Quarantines. (Extract from a letter to Dr. Mitchill, dated Palermo, February 25, 1806. In *Medical Repository*, 2d Hexade, Vol. III, p. 442. New York, 1806.)

6. Manifesto della Pamphysis Sicula sive Historia Naturalis Animalium, vegetabilium, et mineralium quae in Sicilia vel in circuitu ejus inveniuntur, opus incæptum a P. Franc. Cupani in Panphyto Siculo, continuatum ab Anton. Bonanno Gervasi, Jos. Steph. et Franc. Chiarelliis, et ab C. S. Rafinesque-Schmaltz locupletatum, etc. Palermo, 1807, tab. 1.

Quoted from the "*Specchio delle Scienze*," etc. The work itself was never published. Rafinesque says of it: "The book thus announced was never published, though it would have done much honor to Sicily, and brought to publicity the entire *Panphyton Siculum*, with all the plates, about 700 in number." The "Prospectus" alone was issued.

7. Prospectus of Mr. Rafinesque Schmaltz's two intended Works on North-American Botany; the first on the new Genera and Species of Plants discovered by himself, and the second on the Natural History of the Funguses, or Mushroom-Tribe of America. (In *Medical Repository*, 2d Hexade, Vol. V, pp. 350–356. New York, 1808.)

8. Essential Generic and Specific Characters of some new Genusses and Species of Plants observed in the United States of America, in 1803 and 1804. By Mr. C. G. Rafinesque Schmaltz. In a communication to Dr. Mitchill, dated Palermo, Sept. 1st, 1807. (In *Medical Repository*, 2d Hexade, Vol. V, pp. 356–363. New York, 1808.)

9. Notice on the Medical Properties of some North-American Plants: addressed to Dr. Mitchill by C. S. Rafinesque Schmaltz. (In *Medical Repository*, 2d Hexade, Vol. V, pp. 423, 424. New York, 1808.)

10. Cinquanta figure di nuovi Generi e nuovi Specie di Piante degli Stati Uniti di America, del Sign. C. S. Rafinesque-Schmaltz. Palermo. 1808.

Title quoted from the "*Specchio delle Scienze*," etc. Of this work the plates only were printed.

11. Sei vedute ad acqua forte d'antichita Siciliane fatte incidere dal Sign. C. S. Rafinesque. Palermo. 1808.

This title is quoted from a bibliographical notice on page 141, Vol. I, of the *Specchio delle Scienze*. A plate of "Ruined Pillar in the Elorin-road" (title in Italian, French, and English) is reprinted in this magazine at page 148.

12. Sur les propriétés médicales de quelques plantes de l'Amérique Septentrionale; par M. Rafinesque Schmacty [Schmaltz], traduit du Medical Repository de New-Yorck; par M. Warden, Consul américain. (In Desvaux's *Journal de Botanique*, Vol. I, pp. 126–128. Paris, 1808.)

13. Description des Plantes trouvées dans les Etats-Unis d'Amérique, en 1803 et 1804, par M. Rafinesque-Schmaltz, communiquée à M. Mitchill, membre du Sénat des Etats-Unis, et un des Rédacteurs du Medical Repository de New-Yorck, dans un lettre datée de Palerme, 1 septembre 1807; traduite du Medical Repository, vol. 5, p. 356, avril 1808; par M. Warden, Consul américain. (In Desvaux's *Journal de Botanique*, Vol. I, pp. 218–234. Paris, 1808.)

14. Prospectus de M. Rafinesque Schmaltz, relatif à deux ouvrages sur la Botanique du Nord de l'Amérique; traduit du Medical Repository de New-Yorck, vol. 5, p. 350, par M. N. A. Desvaux. (In Desvaux's *Journal de Botanique*, Vol. II, pp. 166–178. Paris, 1809.)

15. Caratteri | di alcuni nuovi generi | e nuovi specie | di animali | e piante della Sicilia | con varie osservazioni sopra i medesimi. | —— | Opuscolo | del Sig. C. S. Rafinesque Schmaltz | —— | Palermo | 1810. | Per le stampe di Sanfilippo. | —— | Con Approvazione. [8°. pp (4) 1–105 (1), pll. xx (77 figures).] Dated "Palermo, Aprile 1, 1810."

Rafinesque says of this book:*

"It would not be proper to praise one's own production, so it must suffice to say that in this classical work ('*opera classica*') are described 24 new species of Birds and Reptiles, 51 new genera and 154 new species of Fishes, 21 new genera and 188 new species of Plants, terrestrial and marine, all observed in Sicily and undescribed ('*inediti*'). It would be rare good fortune to be able to effect elsewhere in Europe such an aggregate of discoveries and new Creatures: nevertheless this is only the least part of the Author's observations, and is simply a prelude to that which he expects to give to the world when the times are more propitious to Science. He has nearly ready for the press a Fauna and Flora of Sicily, both classical works which will be brought to light as soon as he is appointed to one of the Professorships which he is seeking."

One of these professorships was that of the Chair of Botany in the University of Palermo, which had been filled by Professor Tineo. Both Rafinesque and Bivana became candidates, but the choice fell on Tineo's son. The other professorship sought was that of the Chair of Agriculture and Economy, in the same institution. This was finally filled by a "Clerk of a Minister of State", and Rafinesque never attained the desired preferment.

16. Indice | d'Ittiologia Siciliana | ossia | Catalogo Metodico dei Nomi Latini | Italiani, e Siciliani dei Pesci, che | si Rinvengono in Sicilia | Disposti | Secondo un Metodo Naturale | eseguito | da un Appendice che contiene la Descrizione | di alcuni nuovi Pesci Siciliani | Illustrato da due Piance. | —— | Opuscolo del Signore | C. S. Rafinesque Schmaltz | —— | Messina | Presso Giovanni del Nobolo | Con Approvazzione | 1810. | —— | (8vo, pp. 1–70, pl. 2.)

*Notice of and extracts from this work may be found in *Isis*, Band 22, Heft 5, pp. 534–538. Leipzig. 1829.

17. Progress in American Botany. A letter from C. Rafinesque Schmaltz, Esq., of Palermo in Sicily, to Dr. Mitchill, dated May 30, 1809. (In *Medical Repository*, 3d Hexade, Vol. I, p. 297, New York, 1810.)

18. Statistica Generale | di Sicilia | De' Signori | D. D. Giuseppe Emmanuele Ortolani | avvocato e mineralogico | e Constantino S. Rafinesque Schmaltz | negoziante e naturalista | in due parti | Nella prima si descrive il Fisico della Sicilia, | nella seconda il suo Morale. | Palermo | 1810 | Dalla reale stamperia. | (8vo, pp. 49, with two maps.)

Rafinesque remarks:

"The Moral Statistics of Sicily.—('*Il morale della Sicilia*'). The second and more important part of this useful and innocent work, was fully approved by the Royal and Ecclesiastical censors ('*revisori regj e chiesiastici*'), nevertheless its printing was prohibited by a timorous Neapolitan cabinet-minister, because it discussed the condition of the government, the customs service, the army, the public institutions &c of Sicily. The authors intend, however, to print it as soon as we are in the enjoyment of the liberty of the press."

In the "*Specchio*" for February, 1814, p. 80, it is said:

"It is proposed to send to the press the second part of the 'Statistica de Sicilia.'—The 'Statistica Morale' which includes the geographical, constitutional, political, commercial, economic, historical, literary, &c descriptions of Sicily, by Signori Ortolani and Rafinesque, with a map of ancient Sicily and two plates or views, in one quarto volume, at the price of 8 '*tari*' (12 'tari' for the two parts) to be paid on delivery, if before printing there are 100 subscriptions.

"It would be futile to praise such a book, but it should suffice to say that the last Parliament ordered an exact census of the Island.

The authors were the first to conceive such a plan, and had completed it in 1810. They had no access to official documents, and were forbidden to print the book, although it had been approved by the censors. In our feeble judgment it will be of value to all citizens."

19. An Essay on the exotic plants mostly European, which have been naturalized, and now grow spontaneously in the Middle States of North America. By C. S. Rafinesque Schmaltz. [Dated Palermo, 1st Apr., 1810.] (In *Medical Repository*, 3d Hexade, Vol. II, pp. 330–345. New York, 1811.)

20. Botanical information concerning two Families of Plants. I. Species of the genus Callitriche. II. North American species of the genus Potamogeton. (In *Medical Repository*, 3d Hexade, Vol. II, pp. 407–409. New York, 1811. A letter to Dr. Mitchill, dated Palermo, Apr. 1, 1810.)

21. Cento venti tavole del Panphyton Siculum di Cupani, nuovamente fatte incidere col ritrato di Cupani, dal Sig. C. S. Rafinesque-Schmaltz. Palermo. Folio. 1812. pp. ?.

Title quoted from the "*Specchio delle Scienze*," etc. Doctor Goode, who gives me this title, also quotes the following information:

"The famous 'Panphyton Siculum' of Cupani is a book so rare that perhaps only four copies exist in Sicily and Europe. The author of this reprint has had the copy in the library of the Jesuit fathers in Palermo exactly copied at great expense. This contains 650 plates but he has had only 120 engraved, selected specially with the purpose of making this precious work more generally known."

22. Description de quelques Végétaux de Sicile et des Etats-Unis; par Rafinesch [Rafinesque] Schmaltz. (Desvaux's *Journal de Botanique*, Vol. III, pp. 235, 236. Paris, 1813.)

23. Champignons des Etats-Unis. (Desvaux's *Journal de Botanique*, Vol. III, pp. 236, 237. Paris, 1813.)

This paper, devoted to the mushrooms, is one of the very few botanical papers of Rafinesque which deal with cryptogams.

24. Specchio delle scienze | o | giornale enciclopedico di Sicilia | deposito letterario | delle moderne cognizioni, scoperte, ed osservazioni | sopra le scienze ed arti | E particolarmente sopra la Fisica, la Chimica, la | Storia Naturale, la Botanica, l'Agricoltura, la Me- | dicina, il Commercio, la Legislazione, l'Educa- | zione, ec. | —— | Tomo primo | prima annata e primo semestre. | Instruire utilement, est le but où j'aspire. | —— | Palermo | Della Tipografia di Francesco Abate Qm. Domenico. | 1814. (Large 8vo, pp. 1–216. 2 pl.)

The first volume of this rare work consists of the first six numbers of the "Mirror of the Sciences," with the following dates of publication:

Number I. 1 Gennaro 1814. pp. 1–44.
Number II. 1 Febbraro 1814. pp. 45–80.
Number III. 1 Marzo 1814. pp. 81–112. 1 tavola.
Number IV. 1 Aprile 1814. pp. 113–148. 1 tavola.
Number V. 1 Maggio 1814. 149–180.
Number VI. 1 Giugno 1814. 181–216.

Volume two consists of Numbers VII to XII, and ends the work.

The title of the second volume is somewhat different, so that it deserves recognition as a distinct bibliographical unit. It is as follows:

25. Specchio delle scienze | o | giornale enciclopedico di Sicilia | deposito letterario | delle moderne cognizioni, scoperte, ed osservazioni sopra le scienze ed arti | E particolarmente sopra la Fisica, la Chimica, la | Somiologia, l'Agricoltura, la Medicina, la Legis- | lazione, etc. | Scritto dal Signore | C. S. Rafinesque | —— | Tomo secondo | prima annata e secondo semestre. | —— | Instruire utilement, est le but où j'aspire | —— | Palermo | della Tipografia di Francesco Abate Qm Domenico. | 1814. (Large 8vo. pp. 1–192 (?).)

Number VII. 1 Guglio 1814. pp. 1–32.
Number VIII. 1 Agosto 1814. pp. 33–64.
Number IX. 1 Settember 1814. pp. 65–96.
Number X. 1 Ottober 1814. pp. 97–128.
Number XI. 1 November 1814. pp. 129–160.
Number XII. 1 December 1814. pp. 161–192 (?).

The title-page reverse of Volume I has the following note, fixing the chief part of the work on Rafinesque. The note reads:

"Tutte quelle scoverte ed Osservazioni che in questo Giornale non porteranno un nome particulare d'Autore saranno proprie del Sig. C. S. Rafinesque Schmaltz."

This publication, designed to compass the widest range of physical and natural science, appears to have been modeled upon the "*Medical Repository**" of Doctor

**"The *Medical Repository*, comprehending Original Essays and Intelligence relative to Medicine, Chemistry, Natural History, Agriculture, Geography and the Arts; more especially as they are cultivated in America; and a Review of American publications on Medicine, and the Auxiliary Branches of Science. Conducted by Samuel Latham Mitchill and Edward Miller." This title was for the year 1811.

Samuel Latham Mitchill, with which Rafinesque was familiar. He had contributed a number of articles to Doctor Mitchill's journal, itself a magazine of the broadest character. Rafinesque, as editor of the "*Specchio*", appears to have been almost the sole contributor. The journal is mentioned in the "Précis des Découvertes et Travaux Somiologiques" on page four, as follows: "J'ai entrepris depuis le commencement de cette année la redaction d'un Journal letteraire (le seule en son genre ici) dont je publie un numero tous les mois, sous le titre de Specchio delle Scienze o Giornale Enciclopedico di Sicilia etc". With the end of the year it ceased to exist.

To Doctor G. Brown Goode, Assistant Secretary of the National Museum, I am indebted for the full title of this work. He has also kindly made from it the list of separate titles, which are here given. The last number of the second volume is wanting in the Smithsonian Library, and Doctor Goode has supplied the data from other sources. The articles by Rafinesque are as follows:

(1) Manifesto [della "Specchio delle Scienze"]. I. pp. 3–6.

This is dated Palermo, September 15, 1813. "It is a very elaborate plan for an encyclopedic journal, which the editor hopes may become world-wide in its influence" (Goode).

(2) Osservazioni sopra il clima della Sicilia. I. pp. 3–6, 45–47, 81–84.
(3) Nuova Veduta, o Divisione dello Studio Metodico dell' Istoria Naturale. I. pp. 10, 11.
(4) O Quadro del Metodo Sinottico di Somiologia. I. pp. 11–15.
(5) Descrizione d'un nuovo genere di Pesce. *Leptopus peregrinus*. I. pp. 16, 17.
(6) Sopra due nuovi Alberi del Monte Etna. I. pp. 17, 18. [*Betula etnensis*, n. s.; *Spartium etnensis*, n. s.]
(7) Osservazioni sopra la Pioggia terrosa seguita in Palermo nel Mese di Marzo, 1813. I. pp. 18–20.
(8–10) Dicefilo. No. 1, I, pp. 21–23; No. 2, I, pp. 59–62; No. 3, Vol. II, pp. 33–39.

"Three essays on prison reform, published under the section of the journal headed 'Legislazione' with many references to the system in the United States and to a description of the Prisons of Philadelphia and New York, translated from the tracts of LaRouchefoucauld de Liancourt. This is the work catalogued in Rafinesque's French Bibliography under the title 'Dicefile, ou l'Ami de la Justice'" (Goode).

(11) Quadro della Letteratura Siciana nel principio di questo secolo ò Raguaglio dell' Opere stampate in Sicilia dal 1800 a tutto il 1812. I. pp. 35–43.
(12) Memorie sopra le Riforme chi richiede l'Agricoltura Siciliana. I. pp. 48–51.
(13) Paragone di alcuni Stabilimenti, Instituzioni, ed Usi economici ò politici d' Inghilterra e di Sicilia. I. pp. 51–53.
(14) Definizioni delle nuove Classi naturali di Vegetabili. I. pp. 53, 54. [*Eltroginia, Mesoginia, Endoginia, Sinfoginia, Angioginia, Gimnoginia, Faneroginia, Crittoginia, Algolia, Micolia.*]
(15) Illustrazioni di Materica Medica Siciliana [Essempio Zologico.—*Grapsus fluviatilis*]. I. pp. 55–58.

(16) Seguito del Quadro della Letteratura Siciliana nel principio di questo Secolo ò dal 1800 al 1812. I. pp. 72–75, 108–110.

(17) Neogenito Esotico o Definizioni di cento nuovi generi di Piante Esotiche. I. pp. 86–88; 115–117; 156–158; 192–195.
[*Phemeranthus, Phyllepidum, Valentiana, Kinia, Radiana:—Bonannia, Geanthus, Prychanthus, Triclisperma, Viviania:—Bivonea, Crafordia, Wilsonia, Petagnia, Edwardia:—Tenorea, Hexorima, Vireya, Plenckia, Dicarphus.*]

This article, continued through several numbers, had one plate illustrating *Phyllepidum squarrosum.*

(18) Osservazioni microscopiche fatte . . . in Agusto 1812. pp. 88–90. [Describes a new conferva, *Arthrodia linearis,* and two new minute animals, *Xanemus vibroides* and *Paramœcium dioxinum.*]

(19) Seguito del Quadro della Letteratura Siciliana, etc. I. pp. 108–110.

(20) [Quadro degli] Ordini Eltrologici ò Definizioni degli Ordini della prime Classe delle Piante, L'Eltrogynia. I. pp. 113–115.

(21) Seguito delle tre Illustrazioni di Materia Medica Siciliana. 2. Esempio Botanico—Asphodelus ramosus. I. pp. 130–134.

(22) Seguito del Quadro della Letteratura Siciliana del 1800 al 1812. I. pp. 140–143.

(23) Addenda agli Ordini Eltrologici. I. p. 148.

The orders are finally fixed in the "Addenda" as follows:

"Sotto-Classe *Polygynia.*

1. Ord. *Rhodanthia.* 2. Ord. *Perimesia.* 3. Ord. *Adnantheria.*

Sotto-Classe *Eltrandria.*

4 Ord. *Axanthia.* 5 Ord. *Monospermia.* 6 Ord. *Plyrontia.* 7 Ord. *Isandria.* 8 Ord. *Spyridia.* 9 Ord. *Monostimia.* 10. Ord. *Polymesia.* 11 Ord. *Isostimia.*

Sotto-Classe *Symphandria.*

12 Ord. *Adelphidia.* 13 Ord. *Omoplitia.* 14 Ord. *Perimonia.* 15 Ord. *Cyteanthia.* 16 Ord. *Peritalia.*"

(24) Quadro ragionato del Commercio attivo della Sicilia, e di suoi generi d'esportazione, [I. Parte. Produzioni Minerali.] I. pp. 149–153.

(25) Esempio del Metodo Sinottico di Botanica, illustrato nel primo Ordine della prima Classe. I. pp. 154–156.

(26) Osservazioni sopra le Stagioni, e le Pioggie in Sicilia. I. pp. 158–161.

(27) Fine del Quadro della Letteratura Siciliana dal 1800 al 1812. I. pp. 172–175.

(28) Nuova Divisione del Globo Terrestre. I. pp. 181–184.

(29) Nuova Divisione geografica della Sicilia. I. pp. 184–187.

(30) Fine delle tre Illustrazioni di Materia Medica Siciliana del Sign. C. S. Rafinesque. 3. Esempio Mineralogico.—Succinum electricum. I. pp. 187–191.

(31) Descrizione del *Buphthalmum crassifolium*, nuova specie di Pianta delle vicinanze di Palermo. I. pp. 191, 192.

(32) Suplemento al Quadro della Letteratura Siciliana del 1800 al 1812. I. pp. 207–210.

The second volume, the title of which is given above, contains the following articles:

(33) Nuova divisione delle Acque del nostro Globo. II. pp. 3–5. (I. Parte, Talassografia. II. Parte, Dimnografia. III. Parte, Potamografia.)

(34) Descrizione di una nuova pianta Siciliana, *Saponaria Sicula.* II. pp. 7–9.

(35) Quadro delle Instituzioni letterarie e scientifiche della Città di Londra nel 1813. II. pp. 9–13.

(36) Popolazione della Sicilia. II. pp. 13–16.

(37) Quadro della Letteratura Siciliana nel 1813. II. pp. 27–29; 60–62; 91–94; 123–126.

(38) Osservazioni sopra gli Animali Polistomi, ed un nuovo Genere di essi, *Polactoma*. II. pp. 41–43.

(39) Analisi di un Opuscolo Somiologico francese, titolato, Prècis des Découvertes & des travaux somiologiques di C. S. Rafinesque, Palermo, 1814, 55 pagini, 8 pic. II. pp. 43, 44.

(40) Una Osservazione di Nosologia vegetabile. II. p. 45.

(41) Definizioni di due nuove species Siciliane del Genere Hesperis [*H. rupestris* & *H. fasciculata*.] II. pp. 46–47.

(42) Economia pubblica. Quadro dello Studio metodico di questa Scienza. II. pp. 47–50.

(43) Prodromo di Erpetologia Siciliana. II. pp. 65–67; 102–104.

(44) Seguito delle Osservazioni microscopiche si veda il Tom. I., num. 3, pag. 88. II. pp. 68, 69.

[*Volvox fuscus* n. s.; *Volvox ovalis*, n. s.; *Monas punctum*, n. s.; *Zomorphus ocellatus*, n. s.; *Cercaria bispinosa*, n. s.; *Cercaria verticilloides*, n. s.; *Vorticella bidentata*, n. s.]

(45) Definizioni di due nuove Specie Siciliane e frutescenti del genere *Brassica*. II. pp. 69, 70.

[*Brassica montana*, n. s. and *Brassica crispa*, n. s.]

(46) Analisi di un opera francese di Storia Naturale. II. pp. 70–72.

(47) Abbozzo di una nuova Teoria o Classificazione dei Colori. II. pp. 72–74.

(48) Pensieri sopra l'Oreologia ossia lo Studio delle Montagne. II. pp. 76–78.

(49) Scoperta di un intiero Mammonte in Siberia. II. pp. 86–88. [*Elephas mammonteus*, n. s., described.]

(50) Osservazioni sopra le migrazioni dei Pesci. II. pp. 97–100.

(51) Descrizione di un Nuovo Genere di Pesce Siciliano. *Nemochirus erythropterus*. II. pp. 100–102.

(52) Descrizione di un nuova genere di Fungo Siciliano. *Endæmatus albus*. II. p. 105.

(53) Notizia dei minerali e fossili delle vicinanze di Nicosia in Sicilia. II. pp. 105–108.

(54) Descrizione delle Cave Antiche di Nicosia, Sperlinga, etc. II. pp. 108–110.

(55) Osservazioni sopra le specie Siciliane del genere *Phoca*. II. pp. 129–131.

[Discusses *Phoca* and describes *Aglophema*, n. g.; *Selopoda*, n. g.; *Parthenopa*, n. g., and *Aglophema maculata*, n. s.; *Selopoda fusca*, n. s.; *Parthenopa leucogaster*, n. s.]

(56) Descrizione di due nuovi genere di Meduse Siciliane. II. pp. 131, 132.

[*Styripus*, n. g., and *Pterostoma*, n. g.]

(57) Arrivo delle Lodole [skylarks] vicino Palermo nell' autunno. II. pp. 132–134.

(58) Descrizione di una nuova specie di *Marrubium* [*M. saxatile*]. II. pp. 134, 135.

(59) Osservazioni sopra il *Rumex linaria* di Linneo. II. pp. 135, 136.

(60) Nuova Malattia Vegetabile. II. p. 136.

(61) Memoria sopra i Venti in Sicilia, le Aure diurne, ed il Scirocco. II. pp. 142–146.

(62) Penseri sopra le Comete di un anonimo inglese. II. pp. 148, 149.

(63) [Nota sopra gli] Caratteri delle specie di due nuovi generi di Quadrupedi fossili, *Palætherium*, e *Anoplotherium*, del Sign. Cuveri. II. p. 153.

(64) Quadro dei Generi di Molluschi pteropodi dei Signori Peron e Lesueur. II. pp. 153–155.

[This article has the following new genera: *Hypterus*, n. g.; *Sarcopterus*, n. g.; *Heteroptera*, n. g.; *Abretia*, n. g.; *Cteniurus*, n. g.; *Dicroptera*, n. g.]

(65) Quadro della Letteratura Siciliana nel 1814. II. pp. 155–158.

(66) Definizioni di 36 nuovi generi di Animali marini. II. p. 161. [Not seen.]

(67) Due ambigue produzioni marine. II. p. 166. [Not seen.]
(68) Enumerazione di 14 spugne di Sicilia. II. p. 168. [Not seen.]

26. Précis | des Decouvertes et Travaux | Somiologiques | de Mr. C. S. Rafinesque-Schmaltz. | entre 1800 et 1814 | Ou choix raisonné de ses principales Decouvertes | en Zoologie et en Botanique, pour servir | d'introduction à ses ouvrages | futurs | —— | De Linné le génie il a choisi pour guide. | —— | Palerme | Royale Typographie Militaire. | 1814. | Aux dépens de l'Auteur. | (24mo. pp. 55.)

This work was in the form of a letter to the botanist Persoon.

27. Principes Fondamentaux | de | Somiologie | ou | les loix de la nomenclature et de la | classification de l'empire organique | ou des animaux et des végétaux | contenant les Règles essentielles de l'Art de leur | imposer des noms immuables et de les | classer méthodiquement | par C. S. Rafinesque-Schmaltz. | —— | Palerme | —— | De l'Imprimerie de Franc. Abate, | aux dépens de l'Auteur. | 1814. (8°, pp. 50 +).

28. Sur les Ouvrages de M. Rafinesque-Schmaltz. (Desvaux's *Journal de Botanique*, Vol. IV, pp. 268–276. Paris. 1814.)

This paper was a reprint of the botanical portion of the "Précis des Découvertes."

29. Chloris Ætnensis | o | le Quattro Florule dell'Etna, | opuscolo | del Sig. C. S. Rafinesque-Schmaltz. | Palermo, Dicembre 1813. | Destinato per essere inserito | nella | Storia Naturale Dell'Etna, | Del Can'co Recupero, | dal suo degno nipote | il Can'co Tes're D. Agatino Recupero | Di Catania. | Catania. 1815. (4to. pp. 15.)

This work formed a portion of Recupero's Natural History of Mt. Etna, the "Storia Naturale e Generale dell'Etna." It was issued in advance of the completed work, and is now very rare.

30. Analyse | de la Nature | ou | Tableau de L'Univers | et | des Corps Organisês | —— | par C. S. Rafinesque | De l'Institut des Sciences naturelles de Naples, et | de la Société Italienne des Sciences et des arts. | —— | La Nature est mon guide, et Linnéus mon maître. | —— | Palerme | 1815 | —— | Aux dépens de l'Auteur. (8vo., pp. 224.)

The frontispiece of the "Analysis of Nature" is a portrait which is believed to be the original of the painting from which the *Popular Science Monthly* portrait was taken. The volume is now among the rarest of all of Rafinesque's writings.

31. Circular Address | on | Botany and Zoology; | followed by the | prospectus of two periodical works; | Annals of Nature | and Somiology of North America. | By C. S. Rafinesque, | of the Royal Institute of Natural Sciences of Naples, | and of several other learned societies | in Europe and America. | —— | Chi fa quanto puo, fa quanto deve. | —— | Philadelphia: | Printed for the Author, by S. Merritt, | 74, south Second street. | . . . | 1816. | (12mo., pp. 36.)

Two editions of this pamphlet, one a 12mo and the other an 18mo, were issued for free distribution.

32. Précis des decouvertes somiologiques ou Distribution methodique de tours les corps de la nature. Palermo. 1816.

I have never seen this work, the title of which is quoted from Rafinesque himself, and do not know whether it is another issue of the earlier work of similar title of 1814. The date of publication is two years later, but identity is more than probable.

33. [Review of] Barton's "Flora Philadelphica Prodromus, etc." (*American Monthly Magazine and Critical Review*, Vol. I, No. 5, pp. 356–359. New York. 1817.)

Rafinesque claims, in this review, a number of species previously published by himself.

34. Museum of Natural Sciences. By C. S. Rafinesque, Esquire. 1. Description of the Tubipora Striatulæ, a new species of Fossil from the State of New-York. (*American Monthly Magazine and Critical Review*, Vol. I, No. 5, pp. 359, 360. New York. 1817.)

Striatulæ is a misprint for *striatula*, which is spelled correctly in the article.

35. [Museum of Natural Sciences.] 2. Specimens of several new American species of the genus Aphis. (*American Monthly Magazine and Critical Review*, Vol. I, No. 5, pp. 360, 361. New York. 1817.)

36. [Museum of Natural Sciences.] 3. New species of Mammifers, noticed in the Notes to the (Tableau methodique des Mammiferes) Methodical Picture of the Mammifers, by D. Desmarets, in the 24th and last volume of the French New Dictionary of Natural History. Paris, 1804. Translated and improved, by C. S. Rafinesque. (*American Monthly Magazine and Critical Review*, Vol. I, No. 5, pp. 361–363. New York. 1817.)

Defines the genus *Mazama*. Describes *Galago minutus*, *Canis leucoxurus*, *Castor europeus*, *Cervus melanopus*, *Mazama bira* and *Mazama pita*. Of these several are simply removed from another genus.

37. [Review of] A Manual of Botany for the Northern States, comprising generic descriptions of all Phenogamous and Cryptogamous plants to the north of Virginia, hitherto described, &c, &c. Compiled by the Editor of Richard's Botanical Dictionary. Albany. Webster & Skinners. 1817. 12mo. pp. 164. (*American Monthly Magazine and Critical Review*, Vol. I, No. 6, pp. 426–430. New York. 1817.)

This reviews very harshly the first edition of Eaton's Botany. The review begins thus:

"The work before us, has no higher claim than to the title of a mere compilation; but compilations are sometimes very useful when properly and skilfully executed, and this manual professing utility as its avowed object, it may be incumbent to examine how far this desideratum has been attained. It is ushered under the patronage of the members of the Botanical Class in Williams' College, Massachusetts, for whose use it appears to have been compiled, and whose thanks are offered to the author for his pains. While it must be highly gratifying to observe that as many as sixty-three students have signed that address, and attended the lectures on mineralogy and botany, delivered by the author in that College, and while they express their gratitude towards him in terms highly commendable, it may be proper to hint, that students are not in general the best judges of what is most useful in their pursuits. What they deem such, may often prove otherwise, and they are but seldom enabled to detect the errors of their teachers, while they are taught to consider them as doctrines and truths."

38. Museum of Natural Sciences. By C. S. Rafinesque, Esquire. 4. Dissertation on Water Snakes, Sea Snakes and Sea Serpents. (*American Monthly Magazine and Critical Review*, Vol. I, No. 6, pp. 431–435. New York. 1817. Reprinted, with same title, in *The Philosophical Magazine and Journal*, London, Vol. LIV, pp. 361–367. 1819.)

Describes *Ophinectes* n. g., *Natrix*, n. g., and new species as follows: *Natrix dorsalis*, *Platurus laurenti*,* *Hydrophis cyanura*, *Pelamis schneideri*, *Pelamis marginatus*, *Pelamis fuscatus*, *Ophinectes cinereus*, *Ophinectes viridis*, *Ophinectes luteus*, *Ophinectes cerulescens*, *Ophinectes versicolor*, *Ophinectes maculatus*, *Ophinectes punctatus*, *Ophinectes crythrocephalus* [misprint for *erythrocephalus*], *Ophinectes dorsalis*, and *Ophinectes major*.

39. [Museum of Natural Sciences.] 5. Extracts from the Journal of Mr. Charles LeRaye, relating to some new Quadrupeds of the Missouri Region, with notes by C. S. R. (*American Monthly Magazine and Critical Review*, Vol. I, No. 6, pp. 435–437. 1817.) [*Corvus* [*cervus*] *macrurus*, n. s.; *Canis chlorops*, n. s.; *Cervus melanurus*, n. s.; *Melesium pratense*, n. s.; *Felis misax*, n. s., and *Lynx aureus*, n. s.]

40. [Museum of Natural Sciences.] Botany. 6. Neogenytum Siculum, or Descriptions of four new genera of Dicotyle Sicilian Plants. (*American Monthly Magazine and Critical Review*, Vol. I, No. 6, pp. 437–439. 1817.)

*The description of this form is the very briefest that I remember ever having seen in a work on natural history. It reads: "2. sp. Platurus laurenti Raf. Tail obtuse."

41. [Museum of Natural Sciences.] 7. Description of seven new Species of Sicilian Plants. (*American Monthly Magazine and Critical Review*, Vol. I, No. 6, pp. 439, 440. 1817.)

42. [Museum of Natural Sciences.] 8. Florula of the White Mountain of New-Hampshire. (*American Monthly Magazine and Critical Review*, Vol. I, No. 6, pp. 440–442. 1817.)

43. Museum of Natural Sciences. By C. S. Rafinesque, Esq. 9. Synopsis of four New Genera and ten new Species of Crustacea, found in the United States. (*American Monthly Magazine and Critical Review*, Vol. II, No. 1, pp. 40–43. 1817.)

44. [Museum of Natural Sciences.] 10. First decade of undescribed American Plants, or Synopsis of new species, from the United States. (*American Monthly Magazine and Critical Review*, Vol. II, No. 1, pp. 43, 44. 1817.)

45. [Museum of Natural Sciences.] 11. Descriptions of seven new genera of North American Quadrupeds. (*American Monthly Magazine and Critical Review*, Vol. II, No. 1, pp. 44–46. 1817.) [*Mazama*, *Diplostoma*, p. 44; *Geomys*, *Cynomys*, *Anisonyx*, *Mynomes*, p. 45; *Lynx*, p. 46.]

46. Survey of the progress and actual state of Natural Sciences in the United States of America, from the beginning of this century to the present time. (*American Monthly Magazine and Critical Review*, Vol. II, No. 2, pp. 81–89. 1817.)

This article was to be continued, having surveyed but a portion of the field, but the design was never completed. It is a very masterly piece of work.

47. Museum of Natural Sciences. 12. Description of the Ioxylon Pomiferum, a new genus of North American tree. (*American Monthly Magazine and Critical Review*, Vol. II, No. 2, pp. 118, 119. 1817.)

48. [Museum of Natural Sciences.] 13. Second Decade of undescribed American Plants. (*American Monthly Magazine and Critical Review*, Vol. II, No. 2, pp. 119, 120. 1817.)

49. [Museum of Natural Sciences.] 14. First Decade of new North-American Fishes. (*American Monthly Magazine and Critical Review*, Vol. II, No. 2, pp. 120, 121. 1817.)

50. [Review of] American Entomology, or Descriptions of the Insects of North America, illustrated by coloured figures from drawings executed from nature, by Thomas Say, &c. (*American Monthly Magazine and Critical Review*, Vol. II, No. 2, p. 143. 1817.)

Rafinesque does not give this book by Say a very complimentary notice. He says, among other things: "The United States can at last boast of having a learned and enlightened Entomologist in Mr. Say. Those who have preceded him . . . have merely been collectors . . ." He then proceeds to complain of the cost of the publication, saying, "we are offered an elegant specimen of typography: but the price of it is two dollars. For that sum we have forty pages (of which twelve are quite blank) and six coloured plates, containing only eight species (whereof five are new) while they might have included sixty . . ." etc.

51. [Review of] Descriptio uberior Graminum et Plantarum Calamariarum Americae septentrionalis, indigenarum et circurum. Auctore D. Henrico Muhlenberg, etc. (*American Monthly Magazine and Critical Review*, Vol. II, No. 2, pp. 143, 144. 1817.)

52. Florula Ludoviciana; | or, | A Flora | of the | State of Louisiana. | —— | Translated, revised, and improved, | from the French of C. C. Robin, | By C. S. Rafinesque, | Of the Royal Institute of Naples, the Academy of Natural Sciences of | Philadelphia, the Literary and Philosophical Society of New- | York, the Lyceum of Natural History of New-York, | &c. &c. &c. Author of the Analysis | of Nature &c. &c. &c. | —— | *Quand les matériaux sont imperfaits, l'édifice ne peut pas être complet.* | —— | New-York: | Published by C. Wiley & Co. | No. 3 Wall-Street. 1817. | Price One Dollar. (8vo, pp. 178.)

This is the volume which first of all his works has led to and justified the severe criticisms which have been visited upon Rafinesque. The work is based upon a list made by a French traveler, C. C. Robin, who journeyed through Louisiana and Florida in 1802–1806. Returning to Paris he published in the following year, 1807, in three volumes, his observations and notes. Robin was not a botanist, nor indeed is there any thing in his work that would indicate more than a passing acquaintance with natural objects. Nevertheless he lists, in an appendix, Vol. III, pp. 311–525, *Flore Louisianiase*, a number of common plants, many of which could not possibly have been correctly identified. From the list so made up "was fabricated, by Rafinesque, a fancy work called *Florula Ludoviciana*". It may be further said that Rafinesque was never within a thousand miles of the region included in this volume. The book must go

down to history as a monument to an uncontrolled love of genus-making. It marks the beginning of the period of the decadence of the influence of Rafinesque among his contemporaries. I know of but one copy in Kentucky, and that one belongs to the library of the late Doctor Robert Peter, of Lexington.

53. Museum of Natural Sciences. 15. Introduction to the Ichthyology of the United States. (*American Monthly Magazine and Critical Review*, Vol. II, No. 3, pp. 202, 203. 1818.)

54. [Museum of Natural Sciences.] 16. Descriptions of two new genera of North American Fishes, Opsanus and Notropis. (*American Monthly Magazine and Critical Review*, Vol. II, No. 3, pp. 203, 204. 1818.)

55. [Museum of Natural Sciences.] 17. Second Decade of new North-American Fishes. (*American Monthly Magazine and Critical Review*, Vol. II, No. 3, pp. 204–206. 1818.)

56. [Museum of Natural Sciences.] 18. Third Decade of new Species of North-American Plants. (*American Monthly Magazine and Critical Review*, Vol. II, No. 3, pp. 206, 207. 1818.)

57. [Review of] Pursh's "Flora Americana Septentrionalis". (*American Monthly Magazine and Critical Review*, Vol. II, No. 3, pp. 170–176. Also, in continuation, Vol. II, No. 4, pp. 265–269. 1818.)

58. [Review of] Bigelow's "Florula Bostoniensis". (*American Monthly Magazine and Critical Review*, Vol. II, No. 5, pp. 342–344. 1818.)

59. Second Memoir on the Genus Aphis, containing the Description of 24 new American Species. By C. S. Rafinesque. (*American Monthly Magazine and Critical Review*, Vol. III, No. 1, pp. 15–18. 1818.)

60. [Review of] Elliott's "A Sketch of the Botany of South-Carolina and Georgia". (*American Monthly Magazine and Critical Review*, Vol. III, No 2, pp. 96–101. 1818.)

61. [Review of] Eaton's "An Index to the Geology of the Northern States, with a transverse Section from the Catskill Mountains to the Atlantic, etc." (*American Monthly Magazine and Critical Review*, Vol. III, No. 3, pp. 175–178. 1818.)

62. [Review of] Journal of the Academy of Natural Sciences of Philadelphia. Vol. I, Part I, &c. (*American Monthly Magazine and Critical Review*, Vol. III, No. 4, pp. 269–274. 1818.)

63. Discoveries in Natural History, made during a Journey through the Western Region of the United States. (*American Monthly Magazine and Critical Review*, Vol. III, No. 5, pp. 354–356. 1818.)

This is a letter to Samuel L. Mitchill, President, and the other members of the New York Lyceum of Natural History, and was dated from Louisville, Kentucky, July 20, 1818.

64. Further Discoveries in Natural History, made during a Journey through the Western Region of the United States. (*American Monthly Magazine and Critical Review*, Vol. III, No. 6, pp. 445–447. 1818.) [*Musculus leucopus; M. nigricans, etc.*]

That part of this paper which deals with the descriptions of new bats has been reproduced in the Bulletin U. S. Nat. Mus. No. 43, Appendix, p. 183, 1893, by Doctor Harrison Allen.

65. Discoveries in Natural History made during a Journey through the Western Region of the United States. (*American Monthly Magazine and Critical Review*, Vol. IV, No. 1, pp. 39–42. 1818.)

This and the title immediately preceding were letters to the New York Lyceum of Natural History, through Doctor Mitchill.

66. General Account of the Discoveries made in the Zoology of the Western States in 1818. (*American Monthly Magazine and Critical Review*, Vol. IV, No. 2, p. 107. 1818.)

67. Description of three new genera of fluviatile Fish, Pomoxis, Sarchirus, and Exoglossum. By C. S. Rafinesque. Read Dec. 1st and 8th. (*Journal Academy Natural Sciences*, Philadelphia, Vol. I, Part II, pp. 417–422. With one plate. 1818.)

68. A Journal of the Progress of Vegetation, near Philadelphia, between the 20th of Ferbuary and the 20th of May, 1816, with occasional Zoological Remarks. (*American Journal of Science*, Vol. I, 1st Series, pp. 77–82. New York, 1818.)

69. Description of a New Species of North American Marten (Mustela vulpina). (*American Journal of Science*, 1st Series, Vol. I, pp. 82–84. 1818.)

This paper was republished in *The Philosophical Magazine and Journal*, London, Vol. LIII, pp. 411, 412. 1819.

70. Natural History of the Scytalus Cupreus, or Copper-head Snake. (*American Journal of Science*, 1st Series, Vol. I, pp. 84–86. 1818.)

71. Descriptions of Species of Sponges observed on the Shores of Long-Island. (*American Journal of Science*, 1st Series, Vol. I, No. 2, pp. 149–151. 1818.)

72. Memoir on the Xanthium maculatum, a New Species from the State of New-York, &c. (*American Journal of Science*, 1st Series, Vol. I, No. 2, pp. 151–153. 1818.)

73. Description of a New Genus of North American Fresh-water Fish, Exoglossum. (*American Journal of Science*, 1st Series, Vol. I, pp. 155, 156. 1818.)

74. New Genus of American Grasses, (*Diploea barbata*). (*American Journal of Science*, 1st Series, Vol. I, pp. 252–254. 1818.)

75. Prodrome de 70 nouveaux Genres D'Animaux découverts dans l'intérieur des Etats-Unis D'Amerique, durant l'année 1818. (*Jour. de Physique, de Chemie et D'Histoire Naturelle, et des Arts*, etc. Paris. Tome 88. 1819. pp. 417–429. See also, *Isis, Litterarischer Anzeiger*, pp. 236–244. Jena, 1820.)

76. Description and Natural Classification of the Genus Floerka. (*American Journal of Science*, 1st Series, Vol I, No. 4, p. 373. 1819.)

77. Descriptions of Three new Genera of Plants, from the State of New York. Cylactis, Nemopanthus, and Polanisia. (*American Journal of Science*, 1st Series, Vol. I, No. 4, p. 377. 1819.)

78. Notice on the Myosurus Shortii. (*American Journal of Science*, 1st Series, Vol. I, No. 4, p. 379. 1819.)

79. Thoughts on Atmospheric Dust. (*American Journal of Science*, 1st Series, Vol. I, No. 4, pp. 397–400. 1819.)

80. [Review of] Nuttall's "The Genera of North-American Plants, etc." (*American Monthly Magazine and Critical Review*, Vol. IV, No. 3, pp. 184–196. 1819.)

81. Result of the Botanical Discoveries made in the Western States by C. S. Rafinesque. (*American Monthly Magazine and Critical Review*, Vol. IV, No. 3, pp. 207, 208. 1819.)

82. Description of a New Genus of Fluviatile Bivalve Shell, of the family of Brachiopodes; Notrema Fissurella; in a letter to Dr. S. L. Mitchill, Prof. of Nat. Hist., &c, New-York. (*American Monthly Magazine and Critical Review*, Vol. IV, No. 5, p. 356. 1819.)

83. On some new Genera of American Plants. Extract of the third Letter of C. S. Rafinesque, to Mr. Decandolle, Professor of Botany at Genevra, and author of the new Species Plantarum, dated Philadelphia, 25th Feb., 1819. Translated from the French. (*American Monthly Magazine and Critical Review*, Vol. IV, No. 5, pp. 356–358. 1819.)

84. On the introduction and cultivation of the Tea-Plant, in three Letters from C. S. Rafinesque, Esq. to the Hon. S. L. Mitchill. Read before the Lyceum of Natural History, Feb. 8, 1819. (*American Monthly Magazine and Critical Review*, Vol. IV, No. 5, pp. 382–384. 1819.)

85. Letter to the Editor of the American Monthly Magazine, on the Date-Tree, or Palm. By C. S. Rafinesque. (*American Monthly Magazine and Critical Review*, Vol. IV, No. 6, pp. 465–467. 1819.)

86. Prodrome des nouveaux Genres de Plantes observés en 1817 et 1818 dans l'intérieur des États-Unis d'Amérique. Par C. S. Rafinesque, Professeur de Botanique et d'Histoire naturelle dans l'Universite de Lexington. (*Journal de Physique*, etc., Vol. LXXXIX, pp. 96–107. Paris. Aout, 1819.)

Describes fifty genera. Contribution dated from Philadelphia, May 1, 1819.

87. Descriptions De onze Genres nouveaux de Mollusques, publies en 1814. (*Jour. de Physique*, etc. Paris. Tome 89, p. 150. 1819.)

88. Remarques critiques et synonymiques sur les Ouvrages de MM. Pursh, Nuttall, Elliott, Jorrey, [Torrey], Barton, Muhlenburg, etc., sur les Plantes des Etats Unis. (*Journal de Physique*, etc., Vol. LXXXIX, pp. 256–261. Paris. Octobre, 1819. Ninety items. Dated Philadelphia, May 1, 1819.)

89. On the different Lightnings observed in the western states, by C. S. Rafinesque, Professor of Botany and Natural History in Transylvania University. (*Western Review and Miscellaneous Magazine*, Vol. I, No. 1, August, pp. 60–63. Lexington, 1819.)

This paper describes ten species or varieties of lightning in a style which some suppose closely approaches the formal modes of plant description. It has subjected its unfortunate author to remarkably severe criticisms, but mainly from those who never have seen the paper itself. I have read the paper with the greatest care, more than once, but I fail to find in it more than an attempt to describe the various phenomena connected with electrical displays. In no case has a name of a binomial character, either Latinized or not, been bestowed upon a single variety said by Rafinesque to have been observed by him. So many misleading things have been said about this paper, some of them copied by interested persons, that justice requires the truth to be told. I have seen no mention of this paper by the critics save where introduced by the explanatory remark, "said to have described in natural history style". It is time this fiction was destroyed. Nearly all the remarks which Rafinesque makes have reference solely to the direction of the discharge and to the character of the spark, whether deflected or straight or bent or forked.

It is not claimed by the compiler that the paper has either scientific merit or value, but that it has been used unfairly in detraction.

90. Botany of Kentucky; On its Principal Features. (*Western Review and Miscellaneous Magazine*, August, Vol. I, No. 1, pp. 92–95. 1819.)

A number of typographical errors occurring in this paper are corrected in an *erratum* on p. 128.

91. On the Salivation of Horses. (*Western Review and Miscellaneous Magazine*, October, Vol. I, No. 3, pp. 182–184. 1819.)

92. On the Oil of Pumpkin Seeds. [An open letter to Dr. C. L. Seeger, Northampton, Mass.] (*Western Review and Miscellaneous Magazine*, October, Vol. I, No. 3, pp. 185, 186. 1819.)

93. Descriptions of Two New Shrubs from Kentucky, etc. (*Western Review and Miscellaneous Magazine*, November, Vol. I, No. 4, pp. 228–230. 1819.) [*Betula rupestris*, *Cornus obliqua*.]

94. Descriptions of Two New Species of Foxes from the Western States. (*Western Review and Miscellaneous Magazine*, Vol. I, November, pp. 234–236. 1819.) [*Canis melanurus*, *C. leucurus*.]

95. Natural History of the Fishes of the Ohio River and its Tributary Streams. (*Western Review and Miscellaneous Magazine*, Vol. I, pp. 305–313, December. 1819.) [Introduction to the Fishes and first part of the description of the Ohio river.]

This paper with the several same titles following were collected and published in a separate volume in 1820. See the *Ichthyologia Ohiensis*.

96. On A Remarkable Ancient Monument near Lexington. (*Western Review and Miscellaneous Magazine*, Vol. I, No. 5, pp. 313, 314, December. 1819.)

97. Description of the Silures, or Catfishes of the River Ohio. (*Quarterly Journal of Science, Literature, and Arts, Royal Institution*, London, Vol. IX, p. 48. 1820.)

98. Description of the River Ohio. (*Western Review and Miscellaneous Magazine*, Vol. I, No. 6, pp. 361–377, January. 1820.)

This paper is a continuation of the Introduction to the Fishes of the River Ohio. On page 368 the descriptions of the fishes begin.

99. La Divinite: Ode Sacree, A Echo et Chorus Responsif. (*Western Review and Miscellaneous Magazine*, Vol. I, January, pp. 383, 384. 1820.)

100. Fishes of the River Ohio. (*Western Review and Miscellaneous Magazine*, Vol. II, February, pp. 49–57. 1820.)

101. Monthly Results of Meteorological Observations, made in Lexington by Professor Rafinesque. (*Western Review and Miscellaneous Magazine*, Vol. II, February, pp. 57, 58. 1820.)

102. Monthly Results of Meteorological Observations, made in Lexington by Professor Rafinesque. (*Western Review and Miscellaneous Magazine*, Vol. II, March, pp. 122, 123. 1820.)

103. Fragments D'un Poeme sur la Femme. (*Western Review and Miscellaneous Magazine*, Vol. II, March, pp. 127, 128. 1820.)

104. Fishes of the River Ohio. (*Western Review and Miscellaneous Magazine*, Vol. II, No. 3, pp. 169–177, April. 1820.)

105. Monthly Results of Meteorological Observations, made in Lexington by Professor Rafinesque. (*Western Review and Miscellaneous Magazine*, Vol. II, April, pp. 185, 186. 1820.)

106. **Fishes of the River Ohio.** (*Western Review and Miscellaneous Magazine*, Vol. II, No. 4, pp. 235–242, May. 1820.)

107. Description of the Ancient Town near Lexington. In a letter to Caleb Atwater, of Circleville, Ohio. (*Western Review and Miscellaneous Magazine*, Vol. II, No. 4, pp. 242–244, May. 1820.)

108. Fishes of the River Ohio. (*Western Review and Miscellaneous Magazine*, Vol. II, No. 5, pp. 299–307, June. 1820.)

109. Monthly Results of Meteorological Observations, made in Lexington by Professor Rafinesque. April and May. (*Western Review and Miscellaneous Magazine*, Vol. II, June, pp. 310–312. 1820.)

110. Remarks on the Geology of the Valley of the Mississippi. (*Western Review and Miscellaneous Magazine*, Vol. II, July, pp. 321, 322. 1820.) [*Discomphites*, in foot-note on page 326.*]

This is a note prefacing a geological paper by J. D. Clifford, who had published a similar paper in an earlier number, but had died before the appearance of a second one.

111. Fishes of the River Ohio. (*Western Review and Miscellaneous Magazine*, Vol. II, July, pp. 355–363. 1820.)

112. Monthly Results of Meteorological Observations, made in Lexington by Professor Rafinesque. (*Western Review and Miscellaneous Magazine*, Vol. II, July, pp. 374, 375. 1820.)

113. On the Upper Alleghawian Monuments of North Elkhorn Creek, Fayette county, Kentucky. [Letter to Caleb Atwater, Circleville, Ohio, dated July 12, 1820.] (*Western Review and Miscellaneous Magazine*, Vol. III, August, pp. 53–57. 1820.)

*The foot-note, page 326, proposes *Discomphites* for *Maclurite*.

114. Monthly Results of Meteorological Observations, made in Lexington by Professor Rafinesque. (*Western Review and Miscellaneous Magazine*, Vol. III, September, pp. 124–127. 1820.) [This title includes the observations for July, August, September, 1820.]

These records are the very first ever made in Kentucky in a more or less scientific and careful manner. Their examination shows them to have been kept in the true method of more recent times. Many of them contain notes on the flowering of plants and similar matters.

115. Fishes of the River Ohio. (*Western Review and Miscellaneous Magazine*, Vol. III, October, pp. 165–173. 1820.)

116. Fishes of the River Ohio. (*Western Review and Miscellaneous Magazine*, Vol. III, November, pp. 244–252. 1820.)

This paper concludes the series devoted to the fishes, which was separately published from oversheets, with the title next following:

117.* Ichthyologia Ohiensis | or | Natural History | of | the Fishes Inhabiting the | River Ohio | and its Tributary Streams, | Preceded by a Physical Description of the Ohio and its Branches. | —— | By C. S. Rafinesque, | Professor of Botany and Natural History in Transylvania University, etc, etc. | Lexington, Kentucky: | printed for the author | By W. G. Hunt. | (Price one dollar.) | —— | 1820. (8vo, pp. 1–90.)

This little work, which is now very rare, has been the cause of much misunderstanding among naturalists

* For full title see p. 91.

who have devoted themselves to fishes. It is from the same type as the several papers above enumerated, and was issued in a very small edition.

118. Prodrome d'une Monographie des Rosiers de l'Amérique Septentrionale, contenant la description de quinze especes nouvelles et vingt varieties. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome V, pp. 210–220. 1820.)

119. Sur le Genre Houstonia et Description de Plusieurs Especes Nouvelles. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome V, pp. 224–227. 1820.)

120. The Western Minerva, or American Annals of Knowledge and Literature; a Quarterly Journal to be published in Lexington, Kentucky. *Un peu de tout.* Prospectus. (*Kentucky Reporter*, October 16, 1820.)

This is the title of a journal, planned by Rafinesque, of which the first number was published in January, 1821. Of the edition, the size of which is unknown, Rafinesque saved only three copies. The printer refused him the remainder of the edition without payment, and the whole, with the exception of the three copies secured by Rafinesque, was destroyed. Later, in one of his publications, Rafinesque advertises one of these for sale, at a valuation of five dollars, remarking that it was "a unique copy." For several weeks the *Kentucky Reporter* had published a column advertisement of this proposed

journal, which was a marvel of promise. A list of some forty-four articles "already prepared" and destined for publication in the new journal fills about one fourth of the space. Of them the following titles may stand as fair examples: "The Morality of Truth"; "Theory of the Emanation of Beings"; "Theory of the Intellectual World"; "The Pandoceist, or thoughts on everything"; "Enquiries on the Heavenly Spheres"; "The Harmony of the Worlds"; "Descriptions of New Animals and Plants"; "Letters on the Antiquities of Kentucky"; "The Chemical Art of Making sugar with wood"; "Description of 100 Modes of Grafting Fruit Trees"; "New Treatment of Consumption"; "New Theory of Love or the harmonics of Sympathy"; "On the Infinite Calculation of Space and Time", etc., etc. It is really fortunate that the journal failed to secure subscribers! The *Kentucky Reporter* of January 28, 1821, has a notice that "the publication of the Journal is suspended if not abandoned. Hereafter, should a better subscription list be procured, and arrangements more suitable to the success of such a work, be made by the editors, due notice will be given. In the meantime those who have paid their subscriptions in advance shall have them refunded." This "Western Minerva" should not be confounded with the literary journal of similar name,

started in Cincinnati, in 1826, by Francis and William D. Gallagher.

121. **Prodrome d'une monographie de Turbinolies fossiles du Kentucky.** (*Annales Generales des Sciences Physiques* [Bruxelles], Tome V, pp. 231–235. 1820.)

This paper was explanatory of a joint work to be undertaken in conjunction with J. D. Clifford, whose death appears to have been the chief cause of its abandonment. It is one of the two joint titles known to me in connection with Rafinesque's writings.

122. Monographie des Coquilles Bivalves Fluviatiles de la Riviere Ohio, Contenant douze Genres et soixante huit Especes. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome V, Pt. 13, pp. 287–322. 1820.)

This work was republished in 1845, with three plates, in Chenu's Bibliotheque Conchyliologique, Series I, Tome 3, 8vo, pp. 30, Paris. It also formed the basis of Poulson's translation mentioned below, which was published, without the plates, in 1832.

123. Remarques sur les rapports naturels des genres Viscum, Samolus et Viburnum. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome, V, pp. 348–351. 1820.)

124. Tableau Analytique des Ordres Naturelles familles naturelles et genres, de la classe endogynie sous-classe corisantherie. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VI, pp. 76–89. 1820.)

125. Remarques sur le Genre Eustachya, avec une Nouvelle espece. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VI, pp. 97, 98. 1820.)

126. Sur les animaux philostomes et Porostomes. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VI, pp. 359–364. 1820.)

127. Remarques sur quelques Erreurs en Ichthyologiques. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VI, p. 369. 1820.)

128. Remarques sur le genre Jeffersonia. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, p. 18. 1820.)

129. Sur le nouveau Genre Enemion. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, p. 18. 1820.)

130. Nouveau caractere de d'Irillium. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, p. 19. 1820.)

131. Sur quelques Animaux hybrides. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, pp. 85–88. 1820.)

This impossible account was founded solely on statements made by others, some of whom were neither intelligent nor honest. Rafinesque was victimized.

132. Nomenclature Synandrique, ou descriptions des differens modes d'union parmi les etamines. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, pp. 101–107. 1820.)

133. Sur les genres Ṭridynia, Steironema, Lysimachia, etc. (*Ann. Generales des Sciences Physiques* [Bruxelles], Tome VII, p. 192. 1820.)

134. Sur le genre Manis, et description d'une nouvelle espece, Manis leonyx. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, pp. 214, 215. 1820.)

135. Genres Chetyson, Stylyphus etc. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, p. 387. 1820.)

136. Sur les Explosions orageuses. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, p. 388. 1820.)

137. Alluvions fluviatiles. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, p. 388. 1820.)

138. Sur le Knops-Hills du Kentuky. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VII, p. 388. 1820.)

139. Description d'une Araignee qui constitue un Genre nouveau (Tessaops). (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VIII, p. 88. 1821.)

140. Remarques sur les Convolulacees, etc. (*Annales Generales des Sciences Physiques* [Bruxelles], Tome VIII, pp. 268–272. 1821.)

141. Ueber eilf neue Sippen von Mollusken, aufgestellt 1814. (*Isis. Litterarischer Anzeiger*, pp. 244–247. Jena. 1820.)

142. Enquiries on the Galaxy or Milky-Way. (*Western Review and Miscellaneous Magazine*, Vol. III, September, pp. 117–124. 1820.)

This paper is introduced by general astronomic remarks.

143. Annals of Nature | or | Annual Synopsis | of New Genera and Species of Animals, Plants, &c. | discovered in North America: | —— | by C. S. Rafinesque, | Professor of Botany and Natural History in Transylvania University, at Lexington | in Kentucky, and Member of several Learned Societies in the | United States and in Europe, &c. | —— | Exertion unfolds and increases knowledge. | —— | First Annual Number, for 1820. | —— | Dedicated to Dr. W. E. Leach, | of the British Museum, London. [Text follows.] (8vo, pp. 16. 1820.)

The portion of this paper which deals with certain new bats is quoted in full by Doctor Harrison Allen in his Monograph of North American Bats, Bulletin U. S. Nat. Mus., No. 43, 1893, p. 184.

144. Sur Plusiers Nouveaux genres de Mollusques. (*Journal de Physique, de la Chimie*, etc., Paris, Tome LXXXVIII, p. 417. 1820.)

145. Monthly Results of Meteorological Observations, made in Lexington by Professor Rafinesque. (*Western Review and Miscellaneous Magazine*, Vol. III, January, p. 375. 1821.)

This title includes the Observations for the months of October, November, and December, 1820.

146. Description of a Fossil Medusa, forming a new Genus, Trianisites cliffordi. (*American Journal of Science*, 1st Series, Vol. III, pp. 285–287. 1821.)

147. Beschreibung einer fossilen Medusa, die eine neue Sippe bildet: Trianisites. (*Isis*, Heft 7, p. 749. Jena. 1823. *Litterarischer Anzeiger.*)

This is a translation of the article in Silliman's Journal, Vol. III, 2, 1821.

148. Clio No. I. Ancient History of North America. (*The Cincinnati Literary Gazette*, Vol. I, No. 8, February 21, pp. 59, 60. 1824.)

149. Neophyton No. I. On a new tree of Kentucky forming a new genus Clandrastus Fragrans. (*The Cincinnati Literary Gazette*, Vol. I, No. 8, February 21, p. 60. 1824.)

150. Neophyton No. II. On the Genus Collinsia, and two new species of it. (*The Cincinnati Literary Gazette*, **Vol. I, No. 11,** March 13, p. 84. 1824.)

151. Clio No. II. Ancient History of America. Monuments of the State of Ohio. (*The Cincinnati Literary Gazette*, Vol. I, No. 14, April 3, pp. 107, 108. 1824.)

152. Clio No. III. Ancient History of North America. On the Mexican Nations. (*The Cincinnati Literary Gazette*, Vol. I, No. 19, May 8, pp. 146, 147. 1824.)

153. Clio No. III.—Concluded. (*The Cincinnati Literary Gazette*, Vol. I, No. 20, May 15, p. 155. 1824.)

154. Clio No. IV. Ancient History of N. A. Biography of the American Solomon. (*The Cincinnati Literary Gazette*, Vol. I, No. 22, May 29, p. 170. 1824.)

155. Clio No. V. To the Editor of the Literary Gazette. On Nazahual, the Nabijos and Comanchees. (*The Cincinnati Literary Gazette*, Vol. I, No. 26, June 26, p. 202. 1824.)

This article of two columns, addressed to the editor of the *Gazette*, gives the authorities for facts mentioned in Clio No. IV, which had been attacked by Burnett, as mentioned in the preceding sketch of Rafinesque's life. Doctor Venable says:* "It is written without acrimony and states that 'although the demand' (in Burnett's card) 'was anonymous and indecorous, therefore unworthy of notice: since it has been admitted into your pages, it requires a short notice'".

* *In lit.*, August 15, 1894.

156. [Review of] Dr. Martin Ruter's Hebrew Grammar. (*The Cincinnati Literary Gazette*, Vol. I, No. 21, May 22, pp. 161, 162. 1824.)

This review is signed only with initials, and is dated from Transylvania University. It is curious and interesting as showing something of Rafinesque's linguistic attainments. Doctor W. H. Venable gives a brief history of this book of Ruter in his "Beginnings of Literary Culture in the Ohio Valley", p. 194.

157. Neophyton No. III. On a new medical plant, Prenanthes opiorina, and a new kind of opium—opiorine. (*The Cincinnati Literary Gazette*, Vol. II, No. 2, July 10, pp. 10, 11. 1824.)

This paper was read before the Kentucky Institute, of which mention has been made, February 11, 1824.

158. Neophyton No. IV. On the new genus Lophactis. (*The Cincinnati Literary Gazette*, Vol. II, No. 4, July 24, p. 28. 1824.)

159. Somiology, ou les lois de la Nomenclature et de la Classification des Vegetaux et des Animaux. (1824.)

I have been unable to obtain any more definite information either as to form or place of publication.

160. Ancient Annals of Kentucky; or Introduction to the History and Antiquities of the State of Kentucky. (Marshall's History of Kentucky, Vol. I, pp. i–ix–47. 1824.)

Oversheets of this work, or chapter, were collated and published under the title given next below. On page 3

is a curious, though useless, ethnological and philological table of the primitive nations and languages. Four words (Heaven, Man, Land, and Water,) were used to form this table, which possesses no real linguistic value.

161. Ancient History, | or | Annals of Kentucky; | with a Survey of the Ancient Monuments | of North America | And a Tabular View of the Principal Languages and Primi- | tive Nations of the Whole Earth. | By C. S. Rafinesque, A. M., Ph. D., | Prof. in Tran. Uni. | Sup't. of the Trans. Bot. Garden | Sec'y of the | Kent Institute, and member of the following Societies: | Imp. Nat. Cur. of Bonn: Lit. & Phil. Soc. of New York, | Imp. Econ. Soc. of Vienna, Lyc. of Nat. hist. of New York, | R. Inst. of Sciences of Naples, | Ac. of Nat. Sc. of Philadelphia, | It. Ac. of Arts and Sciences, | Antiq. Soc. of Tennessee, | Lin. Soc. of Paris; Med. Soc. of Cincinnati, | Amer. Antiq. Soc.; Med. Soc. of Lexington, | Histor. Soc. of New York, &c, &c, &c, | (Numquam otiosus.) | —— | Frankfort, Kentucky. | ═══ | Printed for the Author. | ═══ | 1824. (8vo, pp. 1–39 [1].)

This work consists of the oversheets of the article used by Marshall in his "History of Kentucky". The second page contains a dedication of the work to "Alexander de Humboldt, in token of the high value set upon his researches in America".

162. Clio No. VI. On the Panis Language and Dialects. (*The Cincinnati Literary Gazette*, Vol. II, No. 7, August 14, pp. 50, 51. 1824.)

163. Clio No. VII. On the White-Tribes of America, etc. (*The Cincinnati Literary Gazette*, Vol. II, No. 23, December 24, p. 178. 1824.)

164. Clio No. VIII. On erroneous criticism. (*The Cincinnati Literary Gazette*, Vol. III, No. 12, March 19, pp. 89, 90. 1825.)

This article constitutes a reply to a rather unfavorable review, conceived in a semi-humorous vein, of Rafinesque's "Ancient Monuments and Ancient History of Kentucky". The review to which it is a reply may be found in the *Cincinnati Literary Gazette*, Vol. II, December 25, 1824, pp. 203, 204.

165. Neogenyton, or indications of Sixty-six new genera of plants of North America. By C. S. Rafinesque, Professor of Botany and Natural History in the University of Lexington in Kentucky. Dedicated to Professor Decandolle of Geneva. [Lexington?] (8vo, pp. 4. 1825.)

Rafinesque says, at the beginning of this brochure, "Some of these plants were indicated last year, 1824, in the Catalogue of the Botanic Garden which I have tried in vain to establish in Lexington".

166. Useful Inventions. (*The Cincinnati Literary Gazette*, Vol. III, No. 9, February 26, pp. 66, 67. 1825.)

167. Outlines | of a General History of America | By C. S. Rafinesque | ═══ | Second Chronological Part | —— | Colunal Annals | of the | Antillary or West Indies | Islands | also Guyana and Brazil | besides the Boreal and Austral Islands | or the whole of America | except | Spanish America and North America | —— | From 1492 to 1775. | Begun in Philadelphia, in October 1827.

This is an unpublished manuscript, forming a book of two hundred and eighty pages, all in the handwriting of Rafinesque. The title was kindly transcribed by Doctor Goode. The work is preserved in the Library of Congress, at Washington, and is one of several manuscripts left by him. It is one of Rafinesque's general historical works projected but never completed.

168. Medical Flora; | or | Manual | of the | Medical Botany | of the United States | of | North America. | Containing | a selection of above 100 figures and descriptions of Medi | cal Plants, with their names, qualities, properties, | history, &c,: | and notes or remarks on nearly | 500 equivalent substitutes. | In two volumes. | ═══ | Volume the first; | A═══H | with 52 plates. | —— | Medical Plants are compound Medicines prepared by the hands of Nature, &c. Med. Princ. 31. | ═══ | By C. S. Rafinesque A. M. Ph. D. | * * * | ═══ | Philadelphia: Printed & Published by Atkinson & Alexander. No. 112 Chestnut Street. 1828. [Vol. II. 1830.]

Vol. I, pp. (4) i–xii, 1–268, pll 1–52. (1828)

Vol. II (Volume the Second with 48 plates) Phila. Published by Samuel C. Atkinson | —— | (1830). pp. 1–276. pll 53–100.

This work, which possesses real value, was dedicated to Doctor Torrey, Doctor Short, and Stephen Elliott, Esq. The matter is alphabetically arranged, and embellished with plates which are in outline and printed in green ink. A considerable number of copies were purchased by individuals at the auction sale of the effects of Rafinesque.

169. Price One Dollar. | The Pulmist; | or, | Introduction to the Art of Curing and Preventing the | Consumption | or | Chronic Phthisis. | A Medical Essay, including a new and better Distinc- | tion of its Causes, Kinds, Remedies, Diets, | and other Peculiarities. | —— | The Consumption is not an incurable disease; but its reme- | dies are to be chiefly conveyed to the lungs by breathing | or inhalation—110. | —— | By Prof. Rafinesque, Ph. D. & Pulmist. | Professor of Practical and Medical Botany, Natural and Civil | History, &c, &c. | Author of the Manual of Medical Botany of the United States, the | Analysis of Nature, and 50 other works or phamphlets. | Member of the Medical Societies of Cincinnati and Lexington; the Philadelphia | Society and Lyceum of New York; the Academy of Natural Sciences of Philadel- | phia; the American Antiquity Society of Worcester and Nashville; the Kentucky | Institute, &c; and of several learned Societies of Europe, in Paris, Bruxelles, Vi- | enna, Bonn, Florence, Naples, &c. | —— | Philadelphia: | Printed for the Author, | By C. Alexander, 112 Chestnut street. | —— | 1829. (8vo, pp. 72, 1 fig.)

This curious work has no scientific medical value. During these years, which were among the saddest of the last decade of our author's life, he engaged in the practices that now commonly attach to medical charlatans. Two extracts from this book will serve to show that his methods were not at all unlike those adopted at the present day. On page 8 he writes: "My dislike of every appearance of empiricism, and my wish to avoid censure, induced me to conceal myself under the name

of MEDICUS; and thus for two years I have often practiced, with some restraint, and under many disadvantages". And, again, page 69, "I have avoided to publish venal certificates and recommendations of its [pulmel] effects, in order to shun the appearance of empiricism. I have merely published in the Saturday Evening Post, the medical statements of six or seven cases and cures, and I now add here those of as many more, in as brief form as possible". The quotation from page 110 on the title page indicates an understanding of the "germ theory of disease" quite unusual for his time.

170. Eight Figures, | Twenty-five Cents. | —— | American Manual | of the | Grape Vines | and the | Art of making Wine: | including | *An Account of* 62 *Species of Vines, with nearly* 300 *Varieties. An account of the Principal Wines, Ame* | *rican and Foreign. Properties and uses of Wines* | *and Grapes. Cultivation of Vines in America, and* | *the Art to make good Wines.* | With 8 figures | —— | By C. S. Rafinesque, A. M. Ph. D. | Professor of Natural History, Practical and Medi- | cal Botany, &c. in Philadelphia; Member of | twelve learned societies in America | and Europe; Author of many | works, &c. &c. &c. | —— | *Let every Farmer drink his own Wine.* | —— | Philadelphia: | Printed for the Author. | —— | 1830. | (pp. 64. and one page "additions to this manual"; 2 plates with 8 figures of grape-leaves.)

Eight drawings illustrate this work, which is made up of oversheets from volume two of the Medical Flora. It comprises the whole of the article on *Vitis*. The cover of the brochure has certain additions to the text.

171. Enumeration | and Account of some remarkable | Natural Objects in the Cabinet | of Professor Rafinesque, in Philadelphia, | being Animals, Shells, Plants | and Fossils, collected by him | in North America, between | 1816–1831 | by C. S. Rafinesque | Professor of historical and natural sciences | Philadelphia. | William Sharpless, Printer | No. 2 Decatur Street. | 9 pll. 1831.

A manuscript copy of this work exists in the Zoölogical Library of Harvard University.

172. Continuation of a Monograph of the Bivalve Shells of the River Ohio, and other rivers of the Western States (Published at Brussels, September, 1820). Containing 46 species, from 76 to 121. Including an Appendix on some Bivalve Shells of the Rivers of Hindostan, with a Supplement on the Fossil Bivalve Shells of the Western States, and the Tulosites, a new Genus of Fossils. Philadelphia, October, 1831.

173. First Number, For the Spring of 1832. | With two figures, | Melissa and Mammoth Cave. | Atlantic Journal, | and Friend of Knowledge; | A cyclopedic Journal and Review | of universal science and knowledge: | Historical, Natural, and Medical Arts and Sciences: | Industry, Agriculture, education, and every kind of useful knowledge: | with numerous figures. | ═══ | Editor, C. S. Rafinesque, | Professor of Historical and Natural Sciences, and Member of several | learned societies in Paris, Brussels, Vienna, Naples, Bonn, | New York, Philadelphia, Cincinnati, Lexington, &c. | ═══ | Knowledge is the mental food of man. | ═══ | Contents of No. 1. | [List of 36 articles] | Philadelphia: | Published Quarterly at the office of the Atlantic Journal, | No. 59 North Eighth Street, and Dobson's Bookstore, No. 108 Chesnut Street; where subscriptions are received. | Price One Dollar, per Annum in advance, or Two Dollars for twelve numbers. | William Sharpless, Printer, No. 2. Decatur street. | 1832. (12mo, pp. 212.)

This publication was projected on a very broad basis, including, in its scope, "historical, natural and medical arts and sciences: industry, agriculture, education, and every useful information", as the reader is informed on the title-page. Eight numbers are believed to have appeared, at irregular intervals. Of these we have seen a copy of the first number, in the library of Colonel R. T. Durrett; the additional numbers have been noted and abstracted in the library of Harvard University. The work comprises a total of some two hundred and twelve pages, and is mainly made up of short articles by Rafinesque, with an occasional item added by some other writer [?]. It is curious rather than valuable. Following are the contents of the complete periodical, so far as Rafinesque is known to have contributed to it.

In Number 1:

(1) Latent Knowledge. p. 1.
(2) First Letter to Champollion on the Graphic systems of America, and the Glyphs of Otolum or Palenque, in Central America. pp. 4–6.
(3) Tabular View of the American Generic Languages, and Original Nations. pp. 6–8.
(4) The Atlantic Nations of America. pp. 8–10.
(5) Results of the Experiments of Recluz on the Fixed Oils. pp. 12, 13.
(6) Confirmation of the Important Discovery of the property of Sulphur in Trees to destroy all Insects preying on them. pp. 13, 14.

(7) Melissa Officinalis, or Balm. pp. 14, 15.
(8) A selection of 24 out of 100 new species of Plants of North America sent to Europe in 1828 by C. S. Rafinesque. pp. 16–18.
(9) On the Large Wandering Tygers or Jaguars of the United States. pp. 18, 19.
(10) On the North American Couguars. p. 19.
(11) Extracts from A Second Series of Zoological Letters written to Baron Cuvier, of Paris, by Prof. Rafinesque, in 1831. pp. 19–22.
(12) Description of the Sperlerpes or Salamander of the Caves of Kentucky. p. 22.
(13) History of China before the Flood. pp. 22–26.
(14) Early Colonization from China by Sea. p. 26.
(15) The Caves of Kentucky. pp. 27–30.

This paper has a cut of the entrance to Mammoth Cave.

(16) Geological Strata of Ohio and Kentucky. pp. 30, 31.
(17) Gold Mines of North America. p. 31.
(18) Plan of a New Trading Voyage of Industry and Science. pp. 32–34.
(19) Fragment of a Philosophical Poem on Knowledge. p. 36.

In Number 2, Summer of 1832:

(20) Second Letter to Mr. Champollion on the Graphic Systems of America, and the Glyphs of Otolum or Palenque in Central America. Elements of the Glyphs. pp. 40–44.
(21) Primitive Origin of the English Language. pp. 44–48.
(22) The Fundamental Base of the Philosophy of Human Speech, or Philology and Ethnology. pp. 48–51.

(23) On the Zapotecas And other Tribes of the State of Oaxaca. pp. 51–56.
(24) The Domestic Animals of Mankind and the American Nations. pp. 56–61.
(25) On the Moles of North America and two new species from Kentucky. pp. 61, 62.
(26) Description of a New Otter, Lutra Concolor from Assam in Asia. p. 62.
(27) Couguars of Oregon. pp. 62, 63.
(28) Description of a new Eagle from South America, Aquila dicronyx, or Macarran Eagle. p. 63.
(29) On the Salamander of the hills of East Kentucky. S. lurida. pp. 63, 64.
(30) Description of two new genera of Soft Shell Turtles of North America, by C. S. Rafinesque. Apalone and Mesodeca. pp. 64, 65.
(31) Extracts of a Series of Geological Letters to Prof. Al. Brongniart, President of the Geological Society of Paris. pp. 65–67.
(32) Remarks on the Silicious Fossils of North America. (Translated from the French.) pp. 67–69.
(33) Remarks on the Geodes and Geodites. pp. 69, 70.
(34) On the Cavulites and Antrosites. pp. 70, 71.
(35) On the Genera of fossil Trilobites or Glomerites of North America. pp. 71–73.
(36) On the Salses of Europe and America. pp. 73, 74.
(37) On the Lamellites N. G. of American Fossils. p. 74.
(38) Licks and Sucks of Kentucky. pp. 74–77.
(39) Description of a new cherry tree from the Oregon Mountains. p. 78.
(40) Account of 2 N. Sp. of Dionea or Venus fly trap. pp. 78, 79.
(41) New Plants from Bartram's Botanic Garden. pp. 79, 80.
(42) Some Antiquities of Ohio. p. 81.
(43) Economy or Science of Wealth. p. 81.

In Extra of Number 3, September, 1832:

(44) Scientific Travels of the Editor in 1832. p. 85.
(45) The Primitive Black Nations of America. pp. 85, 86.
(46) Savings' Banks at Baltimore. p. 89.

In No. 3, Autumn of 1832:

(47) The American Nations and Tribes are not Jews. pp. 98–101.
(48) The Cradle of Mankind or the Imalaya Mountains. pp. 101–105.
(49) Oreology. Relative Age of Mountains. p. 105.
(50) Geological Survey of the Alleghany Mountains of Pennsylvania, in 1818, from West to East. pp. 105–109.
(51) Description of some of the fossil teeth found in a Cave in Pennsylvania. pp. 109, 110.
(52) Remarks on the Monthly Journal of Geology and Natural Science of G. W. Featherstonaugh, for May 1832 (but only published in July). pp. 110–114.
(53) On the false Rhinoceroides of Featherstonaugh and Harlan. pp. 114, 115.
(54) Geology of the Feroe Islands. p. 116.
(55) Arcibites Rhombifera, a new Encrinite, from the Cabinet of Dr. Cohen, of Baltimore. p. 116.
(56) Lucilites Nigra, a new univalve fossil shell, from the Alleghany Mountains of Pennsylvania. pp. 116, 117.
(57) Ancient Chronology of the Onguys or Iroquois. [A review.] pp. 117, 118.
(58) Vocabulary of the Yarura Language. p. 118.
(59) New and Rare Plants of Maryland near Baltimore. p. 119.
(60) Six New Firs of Oregon. pp. 119, 120.
(61) On 3 N. Sp. of Clintonia. p. 120.
(62) On 3 N. Sp. of Eriocaulon. p. 121.
(63) On 3 New Water Salamanders of Kentucky. p. 121.

(64) A new Tubular fresh water shell of the Alleghany mts. pp. 121, 122.
(65) Fossils of Sherman Creek. p. 122.
(66) Atlantic Review. p. 122.

In Number 4, Winter of 1832:

(67) The Last Indians of New-Jersey. p. 128.
(68) Description of an ancient Mexican Historical manuscript. pp. 128–130.
(69) Table of the successive Dynasties and Incas of Peru. pp. 130–132.
(70) American Languages. Wahtani or Mandan. pp. 132, 133.
(71) Languages of Oregon. Chopunish and Chinuc. pp. 133, 134.
(72) Vulgar names of fossils and petrifactions in North America. p. 137.
(73) Ancient Volcanoes of North America. pp. 137–140.
(74) Oolites of North America. pp. 140, 141.
(75) The Fishes of the United States. pp. 141, 142.
(76) New Fossil Shells of Pennsylvania. pp. 142, 143.
(77) Stratipora and Flexulites. N. G. p. 143.
(78) New Lizard from Kentucky. pp. 143, 144.
(79) Twenty new genera of Plants from the Oregon Mountains, &c. pp. 144–146.
(80) Account of 32 N. Sp. of plants from Florida. pp. 146–148.
(81) On 3 Sp. of Typha. pp. 148, 149.
(82) Two New Genera of Umbelliferous Plants from Kentucky. p. 149.
(83) On 12 N. Sp. of Plants from Illinois, &c. pp. 149–151.
(84) On 17 N. Sp. of Plants from Upper Canada, &c. pp. 151, 152.
(85) Vernasolis, a New Genus. p. 152.
(86) Lophactis N. G. pp. 152, 153.
(87) On 4 N. Sp. of North American Tulips. p. 153.

(88) New Plants of the Alleghany Mts. pp. 153, 154.
(89) Odatelia N. G. of N. American Bivalve fluviatile shell. p. 154.

In Number 5, Spring of 1833:

(90) American Travellers. Who have written their travels? pp. 155–157.
(91) Alleghanies Mountains. pp. 157–161.
(92) The Patagons. pp. 161–163.
(93) N. G. Cauloma. Raf. p. 163.
(94) Principles of the Philosophy of new Genera and new species of Plants and Animals. (Extract of a letter to Dr. J. Torrey, etc.). pp. 163, 164.
(95) N. G. Scandianus. Raf. pp. 164, 165.
(96) On 3 N. G. of Land Shells from Buenos Ayres in South America. p. 165.
(97) On 5 New Fresh Water Shells of Bengal and Assam in Asia. pp. 165, 166.
(98) Commercial Enterprise. p. 166.
(99) Account of the Botanical Collections of Professor C. S. Rafinesque. pp. 169, 170.

In Number 6, Summer of 1833.

(100) Epidermic Varieties of Mankind. pp. 171, 172.
(101) Complexions of Mankind, &c. pp. 172, 173.
(102) Affinities of the English Language with the African Languages and Dialects of Egypt, &c. pp. 173–175.
(103) Sorex dichrurus. N. Sp. of Shrew. pp. 175, 176.
(104) Florula Texensis. Dicotyl. N. Sp. New Dicotyl Plants of Texas and Arkansas, in my Herbarium. pp. 176–179.
(105) G. Dodecatheon or Meadia. pp. 179, 180.
(106) New Amer. Subterranean Plants. pp. 180–182.
(107) Pleuradena Coccinea. N. G. of Mexican Shrub from Bartram's Garden. p. 182.

(108) Orospodias Corymbosa, or Wild Cherry, of Oregon Mts. p. 182.

(109) Incombustible Architecture, Or Fire Proof Buildings of all Kinds, built as Cheap as any combustible buildings. By C. S. Rafinesque, Professor of many sciences, Architect, Draftsman, &c. pp. 183–186.

174. Atlantic Journal.—Extra of No. 6. | Herbarium | Rafinesquianum. | Prodromus.—Pars Prima, | Rarissm. Plant. Nov. | Herbals: or Botanical Collections of C. S. Rafinesque, Professor of Botany, &c, &c, &c. | First Part. | Very Rare New Plants chiefly from Oregon, Texas, Arkansas, Missouri, Illinois, Kentucky, Tennessee, Alabama, Florida, Apalachian and Alleghany Mountains, in North America. Besides Russia, Siberia, Syria, Arabia, Candia, Sicily, Italy, Egypt, Magellania, &c, elsewhere. Collected or acquired between 1800 and 1832. | The Labor of a Whole Life! | Philadelphia: 1833. | Price one dollar. (12mo, pp. 48.)

This small pamphlet contains the following separate articles:

(110) Account of the Botanical Collections of Professor C. S. Rafinesque. pp. 3–10.

(111) Principles of the Philosophy of new Genera and new species of Plants and Animals. (Extract of a letter to Dr. J. Torrey, of New York, dated 1st Dec., 1832.) pp. 11, 12.

(112) Natural Classification of Plants. pp. 12–15.

(113) Extracts from Botanical Letters to Decandolle, Agardh, and Arnott, in 1830, 31, 32, & 33. pp. 16–20.

(114) Florula Texensis. pp. 20–26.

(115) G [enus] Dodecatheon or Media. pp. 26–29.

(116) G [enus] Kuhnia, revised. pp. 29, 30.

(117) G [enus] Helichroa. Raf. 1825. pp. 30–32.

The second part has the following:

(118) Chronological Index of the principal Botanical Works and Discoveries published by C. S. Rafinesque. pp. 33–37.

(119) Index of the Florula Mandanensis of Bradbury* and Rafinesque, published in 1817 and in 1820, with Notes and additions. pp. 37–41.

(120) Monograph of the Species of G. Samolus, in my Herbarium. pp. 41–43.

(121) Genus Cypripedium. pp. 43, 44.

(122) Genus Spiranthes. pp. 44, 45.

*John Bradbury, born August 20, 1768, died 1823. The grave of this famous botanist is in the cemetery at Middletown, near Louisville. This naturalist made a journey up the Missouri river, two thousand nine hundred miles above New Orleans, in 1811. Extensive collections of plants were made; of these some were shipped to England, with the intention of describing the rarer forms. But it appears that his confidence was violated and the collections were submitted, in advance of his return, "to a person of the name of Pursh, who has published the most interesting of my plants in an appendix to the *Flora Americæ Septentrionalis*." (1814.) Bradbury published in his book,† "Travels in the Interior of America, in the Years 1809, 1810, and 1811," on pp. 335–338, a catalogue of the more rare and valuable plants found. This I have carefully compared with the list which Rafinesque gives in his *Florula Mandanensis*, but only very few are the same. There is here an interesting matter connected with these plants; were the names given by Rafinesque bestowed upon plants already named by Bradbury? or did Rafinesque publish first and anticipate the names assigned by Pursh? In any event there is very little evidence that Rafinesque used the Bradbury list, as he did those of Robin and Darby!

†Travels | in The Interior of America, | in the | years 1809, 1810, and 1811; | including | A Description of Upper Louisiana, | together with | The States of Ohio, Kentucky, Indiana, | and Tennessee, | with the | Illinois and western Territories, | and containing | Remarks and Observations | useful to | Persons emigrating to those countries. | —— | By John Bradbury, F. L. S. London, | Corresponding Member of the Liverpool Philosophical Society and Honorary Member of | the Literary and Philosophical Societies, New York, United States, America. | ═══ | Liverpool: | Printed for the author, | By Smith and Galway, | and published by Sherwood, Neely, and Jones, London. | —— | 1817. (8vo, pp. 1–12 [Errata], 9–364.)

(123) G. Jeffersonia and Podophyllum. p. 46.
(124) Fasiculus florula Oregonsis. pp. 46–48.
(125) Florula Apalachensis. (Dicotyl. Fasciculus I.) p. 48.

In Number 7, Autumn of 1833:

(126) Scientific Travels of C. S. Rafinesque, in 1833. pp. 187, 188.
(127) Elevations of land and water, mountains and hills in the State of New York. pp. 188–191.
(128) Some essential views of Geology, by Dr. Hebbert and Rafinesque. pp. 191–195.
(129) Some remarks on the Ruins of Otolum near Palenque. pp. 195–197.
(130) History of Austral America. pp. 197, 198.
(131) Chontal or Tzendal Vocabulary. p. 198.
(132) Gypsies of America. pp. 198, 199.
(133) N. G. Ygramela and Peltimela. p. 199.
(134) On the Custard-apples or Aunona triloba and glabra. pp. 199, 200.
(135) Expexis. N. G. of Water Plants. p. 200.
(136) Substitutes for Tobacco. pp. 200, 201.
(137) Huge Water Volcano. pp. 201, 202.
(138) Improvements in Navigation. p. 202.
(139) Chemical Manufacture, of Professor Rafinesque. (An advertisement, in the first person.) p. 202.

In Number 8, Winter of 1833:

(140) The Luminous Meteors of 1833. pp. 205, 206.
(141) Chronological Index of the principal Botanical Works and Discoveries published by C. S. Rafinesque. pp. 206–208.
(142) Geology and Physical features of the Atlantic Plains of North America. pp. 209–211.
(143) Valedictory. pp. 211, 212.

It will readily be noted that this publication has absolutely no scientific value. The full lists of notes and articles by Rafinesque have been given with the sole hope of thus furnishing additional basis for a judgment concerning the value of his later work.

175. A | Monograph | of the | Fluviatile Bivalve Shells | of the River Ohio, | containing | Twelve Genera & Sixty-eight Species. | —— | Translated from the French of C. S. Rafinesque, Prof. Bot. | and Nat. Hist. in Transylvania University. | —— | Philadelphia: | J. Dobson, 108 Chestnut Street. | 1832. (12mo, pp. i–vi, 7–72.) 1, pl. *unio verrueosa* Ref.

This is an English translation of Rafinesque's earlier work on the shells of the Ohio River, published by his friend Poulson, of Philadelphia. A favorable review by Doctor Harlan, afterward a bitter enemy, may be found in the *Monthly American Journal of Geology*, Vol. I, No. 8, pp. 372–375, February, 1832.

176. Visit to Big-Bone Lick, in 1821. By C. S. Rafinesque, Professor of Historical and Natural Sciences, etc. (*The Monthly American Journal of Geology and Natural Sciences*, Vol. I, No. 8, February, pp. 355–358. 1832.

A critique, with additional information, of an article by William Cooper, in numbers four and five of the same journal. Cooper gives a most excellent map of the locality.

177. **Le Pulmist | ou | Introduction a l'Art de Guérir | et de Prévenir | La Consomption | ou | La Phthisie Chronique; | (Traduit de l'Anglais) | Par M. le Dr C.-S. Rafinesque, | Professeur d'historie naturelle et de botanique | médicale a Philadelphie, |** Auteur du Manuel de Botanique Médicale des États-Unis, | de l'Analyse de la Nature, etc., etc. | Membre des Sociétés médicales de Cincinnati, de Lexington et de Phi- | ladelphie, du Lycée de New-York, de l'Académie des Sciences | naturelles de Philadelphie, de la Société des Antiquitiés américaines | de Worcester et de Neschville, de l'Institute de Kentucky et de plu- | sieurs Sociétés savantes de l'Euope, à Paris, Bruxelles, Vienne, | Bonn, Florence, Naples, etc. | La consumption n'est pas une maladie incurable; mais | les remèdes à y appliquer doivent principalement être | portés au poumon par la respiration ou l'inhalation. | (Le Pulmist, n. 110.) | —— | Paris. | Imprimerie de Dezauche, | Faub. Montmartre, No. 11. | —— | 1833. (8vo, pp. xix, 123.)

178. Letter to Mr. Champollion, on the Graphic Systems of America, and the Glyphs of Otolum, or Palenque, in Central America. (In "American Antiquities and Discoveries in the West", 4th Ed., by Josiah Priest. pp. 118–124. 1834.)

This is a reprint of Rafinesque's article in the *Atlantic Journal and Friend of Knowledge.*

179. Ancient Languages of the first Inhabitants of America. First Letter to Mr. Champollion, on the Graphic Systems of America, and the Glyphs of Otolum or Palenque, in Central America. (In "American Antiquities and Discoveries in the West", 4th Ed., by Josiah Priest. pp. 309–313. 1834.)

Reprinted from the *Atlantic Journal and Friend of Knowledge.* The letter is dated from Philadelphia, January, 1832.

180. Primitive Origin of the English Language. (In "American Antiquities and Discoveries in the West", 4th Ed., by Josiah Priest. pp. 316–323. 1834.)

181. [Review of] Ancient Chronology of the Onguys or Iroquois Indians. By David Cusick. (In "American Antiquities and Discoveries in the West", 4th Ed., by Josiah Priest. pp. 336–338. 1834.)

182. Evidence that a Nation of Africans, the Descendants of Ham, now inhabit a District of South America. (In "American Antiquities and Discoveries in the West", 4th Ed., by Josiah Priest. pp. 340–342. 1834.)

183. A | Life of Travels | and | Researches | in North America and South Europe, | or | Outlines | of | The Life, Travels and Researches | of | C. S. RAFINESQUE, A. M. Ph. D. | Professor of historical and natural scien | ces, member of many learned societies in | Europe and America, | author of many works &c, | containing | His travels in NORTH AMERICA and | the SOUTH of EUROPE; the Atlantic | Ocean, Mediterranean, Sicily, Azores &c, | from 1802 to 1835,—with sketches of his | scientific and historical researches, &c. | —— | Un voyageur dés le berceau, | je le Serais jusqu'au tombeau * * * | —— | Philadelphia, Printed for the Author | By F. Turner, No. 367, Market Street, 1836. | Price Seventy-five cents. (12mo, pp. 1–148.)

This book is now quite rare, and, like some other works by its unfortunate author, seems to have been grossly misinterpreted. Almost all we know of the personal history of Rafinesque is derived from this work. To many it has appeared to be little more than the

product of an overweening vanity, which is further supported by the fact that the narrative is constantly in the first person. It is well, however, to remember that this book was originally written in the form of personal reminiscences to his sister, in whom Rafinesque appears to have taken great interest. This will explain the constant use of the pronoun of the first person. The book is exasperating in a very peculiar way, since very many facts which we wish to know most are omitted entirely. The work should be read by every one desiring to form a just estimate of Rafinesque's earlier scientific work.

184. Bulletin of the Historical and Natural Sciences. No. 3. Philadelphia, May, 1836. pp. 17–24. 24mo.

A copy of this Bulletin, which is but one of a series of advertising pamphlets "distributed gratis", may be seen bound in with "The American Nations", of which it is a prospectus, in the Bates Hall, Boston Public Library. A number of these tracts appeared at different times, irregularly, but are consecutively numbered; they possess no real value.

185. The World, | or | Instability. | A Poem. | In twenty parts. | With notes and illustrations. | * * * | —— | Philadelphia & London: | * * * | 1836. (8vo, pp. 1–248.)

The name of the author does not appear on the title-page nor elsewhere in the volume, but he has in another place confessed authorship; its origin, however, is otherwise unmistakable.

186. The American | Nations; | or, | Outlines of A National History; | of the Ancient and Modern Nations | of North and South America. | * * * | First number or volume Generalities and Annals. Philadelphia, | 1836. (12mo, pp. 260.)
Second number or Volume "Origin and Researches." (pp. 292.)

Each volume has a second title-page as follows:

The American Nations; | or | Outlines of their | General History, | Ancient and Modern: | Including the whole history of the earth | and mankind in the Western Hemisphere; | the Philosophy of American History; | the Annals, traditions, Civilization, | Languages &c of all the Ameri | can Nations, Tribes, Empires | and States. | With Maps, Plates, Views, and Plans of Monuments, | Tables, Notes, and Illustrations. | * * * | First [Second] Volume | * * * | Philadelphia; | C. S. Rafinesque, 110 North Tenth St. | * * * | —— | 1836.

Of this work, planned to comprise twelve volumes, but two volumes were printed. No maps, plates, or illustrations appear. The work was dedicated to "the Society of Geography of Paris." It is a curious assemblage of facts and quotations, many of which have no bearing on the general subject of the work. Very odd anthropologic relations are assumed without basis of real fact.

187. **First Part. Introd. Lexicon, &c | ═══ | New Flora | and Botany | of | North America. | Being a supplemental flora, | To the Various Floras and Botanical Works of Michaux, | Muhlenberg, Pursh, Nuttall, Elliot, Torrey, Beck, Eat- | on, Bigelow,** Barton, **Robin, Hooker, Riddell, Darling- | ton, Schweinitz,** Gibbs, &c. | Besides the general works of Linneus, Wildenow, | Vahl, Vitman, Persoon, Lamark, Decandole, Sprengel, | Jussieu, Adanson, Necker, Lindley, &c. Containing | nearly 500 additional or revised New Genera, and 1500 | additional or corrected New Species, illustrated by | figures in AUTIKON BOTANICON. | By C. S. Rafinesque, A. M.—Ph. D. | Prof. of Botany, the historical and natural sciences— | Member of many learned Societies in Paris, Vienna, | Bonn, Bruxelles, Bordeaux, Zurich, Naples, &c. and | in Philadelphia, New York, Cincinnati, Lexington, &c. | —— | The Floral wealth in this wide land concealed, | Will be at last by learned care revealed. | —— | Philadelphia. | Printed for the Author and Publisher. | 1836.

This work was published in four parts* as follows:

New Flora and Botany of North America. Part First. Introductory Lexicon, Monographs, etc. 1836. (8vo, pp. 1–100.)

New Flora and Botany of North America. Second Part. Neophyton. 1836. (8vo, pp. 96.)

New Flora and Botany of North America. Third Part. New Sylva. 1836. (8vo, pp. 96.)

New Flora and Botany of North America. Fourth Part. Neobotanon. 1836. (8vo, pp. 112.)

In the title of the third and fourth parts the word "great" instead of "general" is employed in describing the "works" of the various authors named. The lines

*From the prospectus we learn that the work was to have consisted of six parts.

are broken in a slightly different manner, but the phraseology is otherwise identical.

188. First Part | of the | Synoptical Flora Telluriana, | Introduction & Classification, | With new Natural Classes, Orders and fami- | lies: preamble of the 2000 New or revised Gen- | era and Species of Trees, Palms, Shrubs, Vines, | Plants, Lilies, Grasses, Ferns, Algas, Fungi &c. | from North and South America, Polynesia, | Australia, Asia, Europe and Africa, omitted or | mistaken by the authors, that were observed or | ascertained, described or revised, collected or | figured, between 1796 and 1836, | By C. S. Rafinesque, A. M. | Prof. of Botany, historical and natural scien- | ces—member of many learned Societies in | Paris, Vienna, Bruxelles, Bonn, Bordeaux, | Zurich, Naples &c. Philadelphia, New York, | Cincinnati, Lexington, &c. | —— | To observe and compare, to correct or approve | By good names and new facts that convince and improve. | —— | Philadelphia: | Printed for the Author | By H. Probasco, No. 119, North Fourth St. | 1836. (8vo, Pt. I., pp. 104; Pt. II, pp. 112.)

189. Autikon Botanicon. | Incones Plantarum Select. Nov. vel Rariorum, | plerumque Americana, interdum African. | Europ. Asiat. Oceanic. &c. | Centur. XXV. | —— | Botanical Illustrations | by Select Specimens or Self-figures in | 25 Centuries of 2500 | Plants, Trees, Shrubs, Vines, Lilies, Grasses, | Ferns &c, chiefly new or rare, doubtful or in- | teresting, from North America and some other | regions; with accounts of the undescribed, notes, | synonyms, localities &c. | In 5 parts of 5 Centuries each of text with | 25 Volumes folio of Self-figures. | By C. S. Rafinesque, | Prof. of Botany, the Historical and Nat- | ural Sciences, member of many learned So- | cieties in America and Europe, author of | many botanical and other works &c. | Part First, Cent. I to V. | (The best botanical figures are the objects themselves) | —— | Philadelphia. | Collected, ascertained and described between | 1815 & 1840.

Text of 500 objects and articles. Phila. 1815–1840. (8vo, pp. 72.)
Second Part. Centuries VI–X. Phila. 1815–1840. (8vo, pp. 68.)
Third Part. Centuries XI to XV. Phila. 1815–1840. (8vo, pp. 60.)

The work has consecutive pagination from 1 to 200. There are no figures. It ended with the third part and is one of the incomplete works of Rafinesque, and further illustrates his mental vacillation.

190. Safe Banking, | including | the Principles of Wealth; | being an enquiry into the principles and | practice of safe and unsafe banks, or | monied institutions in North America, | the defects of the American banking | system and legislation, &c. | By C. S. Rafinesque, | A. M.—Ph. D. Prof. of Historical and Natural Sciences, | member of 15 learned Societies in America and | Europe, Author of 50 Works.—Founder of the | Divitial Institution of North America, and | many other useful Institutions, &c. | —— | Every Bank liable to risks or losses and to sudden calls | is Unsafe.—Every Bank liable to neither is Safe. | —— | Philadelphia: | 1837. | Printed by order and at the expense of the | Divitial Institution of North America, | and 6 per cent Savings-Bank. (12mo, pp. 138.)

191. Alsographia | Americana, | or an American Grove of new or revised | Trees and Shrubs of the Genera Myrica, Caly- | canthus, Salix, Quercus, Fraxinus, Populus, Ti- | lia, Sambucus, Viburnum, Cornus, Juglans, Aes- | culus &c, with some New Genera, Monographs, | and many new Sp. in 330 articles, completing | 1405 G. and Sp. as a continuation of the SYLVA TELLURIANA and North American Trees & | Shrubs. | —— | * * * | Philadelphia. | 1838. | Price One Dollar. (8vo, pp. 1–76.)

192. The Ancient Monuments | of | North and South America. | second edition, | Corrected, enlarged and with some additions, | By C. S. Rafinesque, A. M.—Ph. D. | Professor of Historical and Natural Sci- | ences, Member of many Learned Societies in | Philadelphia, New York, Lexington, Cincin- | natti, Nashville, Paris, Bordeaux, Brussels, | Bonn, Vienna, Zurich, Naples &c, the Amer- | ican Antiquarian Society, the Northern An- | tiquarian Society of Copenhagen &c. | The massive ruins the arts and skill unfold | Of busy workers, and their styles reveal, | The objects and designs of such devisers: | In silent voices they speak, to thinking minds | They teach, who were the human throngs that left | Uplifted marks for witness of past ages. | Philadelphia | 1838. | Printed for the Author. (8vo, pp. 1–28.)

There was never a "first edition" of this pamphlet printed, as might be justly inferred from this title. The matter comprised in this paper appeared in the journal named in the following title. The "Additions" comprise pages 25 to 28, and contain some curious matter. The addition "11" is particularly interesting reading. It runs as follows:

"In my work on Historical Palingenesy or the restoration of ancient nations and languages presumed lost, I have been able to restore many of all the parts of the world (but chiefly America and Europe) in the same manner as I once did for the Haytian nation and language, whereby many historical links will be evolved and traced. My process is similar to that of Cuvier and the modern Paleontologists, who restore extinct animals by fragments of their bones. I do the same with extinct languages by fragments of their words and elements, discovered and put together."

193. Researches on the Antiquities and Monuments of North and South America. (*American Museum*, No. 1, September, 1838. Baltimore.)

This paper originally appeared in a periodical which commenced a new series of the *North American Quarterly Magazine*, a literary monthly periodical undertaken by Brooks and Snodgrass. The original paper has not passed under inspection, but the title is quoted from the second page of the pamphlet named in the preceding reference.

194. Celestial Wonders and Philosophy, or the Structure of the Visible Heavens, with hints on their Celestial Religion and theory of Futurity. Philadelphia. 1838. (16mo, pp. 136.)

Book not seen; quoted from Gray's review of the botanical writings of Rafinesque, which see.

195. Bulletin of the Historical and Natural Sciences. By C. S. Rafinesque, A. M., Ph. D. Philadelphia. (Spring of 1838. No. 7, pp. 37–44.)

This is an advertising sheet, and is mentioned here because it contains a list of Rafinesque's other works and so may prove useful.

196. Genius and Spirit | of the | Hebrew Bible. | Including the Biblic Philosophy of | Celestial Wisdom, Religion and Theo- | logy, Astronomy and Realization, | Ontology and Mythology, Chrono- | metry and Mathematics. | Being the First Series of Bible Truths, | Ascertained and Explained by the | true restored

names and words in Eng | lish Letters, of the Religious and Philoso | phical Conceptions of the OBRI or He- | brew Language relating thereto, that are | found in the MKRE or Hebrew Scrip- | tures, with their meanings and deriva- | tions: whereby the real ancient OBRI | knowledge is restored and found to agree | with the highest modern Knowledge. | By C. S. Rafinesque, A. M., Ph. D., | Prof. of Historical and Natural Sci- | ences, of Languages and comparative | Philology—Member of many learned | Societies in Europe and America—Au- | thor of many Works—Founder of the | Central University of Illinois &c. | Printed for the Eleutherium of Know- | ledge and Central University of Illinois &c. | Philadelphia. | 1838. (12mo, pp. 1–264.)

This work is very clearly that of a man who has lost the power of acute perception and correct ratiocination. It is very curious and odd, but without the least value from any possible standpoint.

197. Sylva Telluriana. | Mantis. [sa] Synopt. [ica] | ═══ | New Genera and Species | of Trees and shrubs of North America, | and other regions of the earth, | Omitted or mistaken by the Botanical Au- | thors and Compilers, | or not properly classified, | now reduced by their natural affinities to the | proper natural orders and tribes. | By C. S. Rafinesque, A. M.—Ph. D. Prof. of Botany, the Natural and Historical Sciences, Member of Many learned Societies, in Paris, Bordeaux, Brussels, Bonn, Vienna, Zurich, Naples, &c.—Philadelphia, New York, | Lexington, Cincinnatti, &c., author of many | works. | Being a supplement to the Flora Telluriana. | —— | (Trees and Shrubs are the Ornaments of the Earth) | —— | Philadelphia: Printed for the Author and Publisher. | —— | 1838. (8vo, pp. 1–184.)

198. American Manual of the Mulberry trees; 25 separate species, 30 varieties; history, &c. with hints on procuring silk out of the bark. Philadelphia. 1839. (12mo, pp. 96. [Not seen.])

199. The | Pleasures and Duties | of | Wealth. | By C. S. Rafinesque. | A. M.—Ph. D. | * * * | —— | * * * | —— | Philadelphia: | Printed for the Eleutherium of Knowledge. | —— | 1840. (8vo, pp. 1–32.)

200. The Good Book—Number I | (300 Figures) | —— | Amenities of Nature | or annals of | Historical and Natural Sciences, | Chiefly on Zoology, Botany, Geology, Agro- | nomy, Ethnography, Philology &c . . . Organ- | ized beings and fossils, Nations and Languages. | with 1000 figures. | By C. S. Rafinesque A. M.—Ph. D. | Professor of those Sciences &c. | —— | Philadelphia | January 1840. | Subscriptions $5 in advance for 10 numbers | —single numbers one dollar each.

This is the title as given on the cover of the volume. The title given on the title-page is quite different, but as it is sometimes quoted it is here given in full. It runs as follows:

The Good Book, | and Amenities of Nature, | or Annals of Historical and Natural | Sciences. | Containing Selections, of observations, resear- | ches and novelties in all the branches of Phy- | sical and Historical Knowledge, with Letters | of eminent Authors—chiefly on Zoology, Botany, | Agronomy, Geognosy, Ethnography . . . or Or- | ganized Beings and Fossils, Nations and Lan- | guages. By C. S. Rafinesque A. M.—Ph. D. | Prof. of Historical and Natural Sciences, | Languages &c, member of 16 Learned Societies | in Europe and America, author of 220 Works, | Pamphlets, Essays and Tracts . . . | —— | The works of God to study and explain, | Is happy toil and not to live in vain. | —— | Philadelphia | 1840. | Printed for the Eleutherium of Knowledge. (8vo, pp. 84.)

The contents are all by Rafinesque, and are as follows:

(17) Monument of the Atlantes, with an inscription 4000 years old — with figures 62 to 68. pp. 71–76.

(18) The Graphic Systems of the Ancient American and Chinese Nations. pp. 76–81.

(19) Agronomy. Oils of India. pp. 81, 82.

(20) Useful trees and plants of East Indies. pp. 82, 83.

(21) Additions and Index. pp. 83, 84.

201. Monographie | des | Coquilles | bivalves fluviatiles | de la Riviere Ohio | par M. C. S. Rafinesque, | Professeur d'Historie Naturelle a l'universite transylvane de Lexington | [Cut] | Paris. | A. Franck, Librarie Editeur | —— | 1845. (8vo, pp. 1–50. [Frontispiece.] pll. I–III.)

202. The | complete writings | of | Constantine Schmaltz Rafinesque | on | recent and fossil | conchology. | —— | Edited by | Wm. G. Binney, and George W. Tryon, Jr., | Members of the Academy of Natural Sciences of Philadelphia. | —— | New York: | * * * * | 1864. (8vo, pp. 1–96, 1–7 [1] pl. I.) (From the *Annales Generales des Sciences Physiques*, Bruxelles, LXXX, LXXXI, LXXXII.)

203. Remarks on the Physical Geography of North America. By C. S. Rafinesque. Philadelphia, April, 1840. (Journal of the Royal Geographical Society, Vol. XI, p. 165. London, 1841.)

This is a posthumous publication, the only one by Rafinesque with which I am acquainted. It consists of thirty numbered paragraphs. The author divides the country into eight great regions, beginning: "1. The Boreal, or region of the lakes. 2. The Atlantic, or region of the littoral plains," etc., etc. Each of these regions is described in detail; there is a plea for the retention

of the "true or Indian names" of every thing; also, there is given a list of the aboriginal names of the mountains; and the general ignorance of all other geographers on the subject is lamented. Not a few references occur relating to former geographic work by himself, including a mention of his map of the Ohio river, made in 1818.

The same volume contains, at the end of the above-mentioned article, some editorial notes which collectively constitute a brief summary of "some Remarks on New Colonies, communicated to the Royal Geographical Society, by the same author, but not published, as the paper contains little that is new", etc. An interesting fact connected with this essay on physical geography is that the plan had been revolved in the mind of Rafinesque for many years. In a column advertisement of the proposed "Western Minerva", printed in the *Kentucky Reporter* for October 16, 1820, is the title of this article, which had then been prepared and was "in hand for publication". It is the last one in the list of works and memoirs by a remarkable though eccentric man.

Summary of Publications.

A summary of this register will serve to indicate very clearly the general bibliographic character of Rafinesque's work. There are relatively few books and pamphlets; magazine articles include by far the greater number of his titles. The following arrangement will present these facts at a glance:

Magazine articles,	144
Books and Pamphlets,	39
Rafinesque's Magazines,	3
Original articles in last,	233
Manuscripts,	1
Total titles,	420

To this summary may be added:

Reprints,	17
Translations,	7
Books from oversheets,	3
Grand total,	447

A further classification by subjects will serve to show the very wide range over which the scientific work of Rafinesque extended. Among these papers botanical subjects, with one hundred and forty-one titles, take precedence; zoölogical papers and pamphlets come next in order with some one hundred and twenty titles, of which

those that relate to ichthyological matters are in excess. A singular fact is next apparent in that historical, rather than scientific, subjects appear to have received attention, there being thirty-nine papers which may be so classed. Poems, with four subjects, one of which comprised some two hundred pages, presents the smallest number of titles.

BIBLIOGRAPHIA INCERTA.

α. The Cosmonist. (Twenty Numbers of articles under this title in the *Kentucky Gazette*, 1822.)

The files of the *Kentucky Gazette*, which were formerly complete and in the Lexington Library, have suffered so much at the hands of unscrupulous visitors that nearly all that portion which comprised the years 1821–1825 has been removed from the library. There is now no complete copy known. The missing portion contained the numbers of the *Gazette* in which these articles of Rafinesque appeared.

β. The Mexicans in 1830.

Said by Rafinesque, in his "Life of Travels", to have been published in 1831. It has been impossible to learn more of the paper.

*BIBLIOTHECA RAFINESQUIANA.

Anonymous. Review of "The Ancient Monuments of Kentucky". (In *The Cincinnati Literary Gazette*, Vol. II, December 25, pp. 203, 204. 1824.) [Editorial?]

Audubon, John J. "The Eccentric Naturalist". (In Ornithological Biography, Vol. I, pp. 455–460. 1832.)

Agassiz, Louis. "Notice upon a Collection of Fishes from the Southern bend of the Tennessee river, in the State of Alabama". (*American Journal of Science*, 2d Series, Vol. XVII, pp. 297 *et seqq.* 1854.)

Allen, Harrison. "A Monograph of the Bats of North America". (Bulletin of the United States Museum, No. 43, pp. 183, 184. 1893. Same matter in Monograph of North American Bats, in Smithsonian Miscellaneous Collections, Vol. VII, pp. xvi, xvii. 1864.)

In these titles are reproduced the descriptions of bats published by Rafinesque in *The American Monthly Magazine* and in "The Annals of Nature."

Binney, Wm. G. and Bland, Thomas. "Note on Mesodon leucodon, of Rafinesque". (Annals New York Lyceum of Natural History, Vol. IX, pp. 294, 295. 1870.)

*Under this title are given, without any attempt at completeness, a list of works from which facts connected with either Rafinesque or his scientific work may be gleaned. The list will be found to comprise papers of a varying and wide range of criticism.

This title also mentions a manuscript work by Rafinesque, never published, under the title of Conchologia Ohiensis.

Brendel, Frederick. "Historical Sketch of the Science of Botany in North America from 1635 to 1840". (*American Naturalist*, Vol. XIII, pp. 764, 765. 1879.)

Call, R. Ellsworth. "Note on the Genus Campeloma of Rafinesque." (*American Naturalist*, Vol. XVII, pp. 603–608. 1883.)

Call, R. Ellsworth. "On the Genus Campeloma Rafinesque, with a Revision of the Species, Recent and Fossil." (Bulletin Washburn College Laboratory of Natural History, Vol. I, pp. 149–165. 1886.)

Chase, Theodore R. "Constantine Schmaltz Rafinesque". (*Potter's American Monthly*, an Illustrated Magazine of History, Literature, Science, and Art, Vol. VI, pp. 97–101. 1876.)

Collins, Lewis. History of Kentucky. (Contains a short sketch of Rafinesque. See Vol. II, pp. 201, 202. Edition of 1882. Rafinesque's list of the sites of ancient monuments in Kentucky is reproduced on pp. 392, 393.)

Conrad, Timothy A. "Synopsis of the Family of Naiades of North America." (Proceedings Philadelphia Academy of Natural Sciences, Vol. VI, p. 243 *et seqq.*; also, *ibidem*, p. 499. 1853.)

Copeland, Herbert E. "A Neglected Naturalist". (*American Naturalist*, Vol. X, pp. 469–473. 1876.)

Dall, William H. "Some American Conchologists." (Proceedings Biological Society of Washington, Vol. IV, pp. 114–117. 1888.)

Featherstonhaugh, G. W. Professor Rafinesque. (*American Monthly Journal of Geology and Natural Science*, January, Vol. I, No. 7, pp. 328, 329. 1832.)

Featherstonhaugh, G. W. "Review of Monograph of the Bivalve Shells of the River Ohio. Translated from the French of Professor Rafinesque, by C. A. Poulson, Esq." (*American Monthly Journal of Geology and Natural Science*, February, Vol. I, No. 8, pp. 372–375. 1832.)

Ferussac, A. E. J. P. J. F. d'Audebard de. "Observations sur les Naiades". (*Magazine de Zoologie*, Numbers 59 and 60. 1835.)

Garman, S. "The Generic Name of the Pastinacas, or Stingrays." (Proceedings of the United States National Museum, Vol. VIII, pp. 221–224. 1885.)

Gill, Theodore. "On the Relations and Nomenclature of Stizostedion or Lucioperca". (Proceedings of the United States National Museum, Vol. XVII, pp. 123–128. 1894.)

Girard, Charles. "Researches upon the Cyprinoid Fishes inhabiting the Fresh-waters of the United States, west of the Mississippi valley, from specimens in the Museum of the Smithsonian Institution". (Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. VIII, pp. 165–213. 1856.)

Goode, G. Brown. "The Beginnings of American Science. The Third Century." An Address Delivered at the Eighth Anniversary Meeting of the Biological Society of Washington. (Proceedings of the Biological Society of Washington, Vol. IV, pp. 25, 26, 37 and 66. 1888.)

Gray, Asa. "Notice of the Botanical Writings of the late C. S. Rafinesque". (*American Journal of Science*, 1st Series, Vol. XL, pp. 221–241. 1841.)

H. H. (Anonymous). Letter to Editor of the Philadelphia *Ledger*, dated 5th May, 1877. (Printed also in the *American Naturalist*, Vol. XI, pp. 574, 575. 1877.)

This is a very inaccurate account, full of misstatements, by some one who intended well.

Haldemann, S. S. "Notice of the Zoological Writings of the Late C. S. Rafinesque". (*American Journal of Science*, 1st Series, Vol. XLII, pp. 280–291. 1842.)

Harlan, Richard, M. D. "Fauna Americana; | being | a Description | of the | Mammiferous Animals | inhabiting North America. | —— | 1825." (See Introduction, p. viii, and Appendix, pp. 302–309.)

Haven, Samuel F. "Archæology of the United States, or, Sketches Historical and Bibliographical of the Progress of Information and Opinion Respecting Vestiges of Antiquity in the United States." (Smithsonian Contributions to Knowledge, Vol. VIII, Article I, pp. 39–41. 1856.)

Jordan, David S. "Contributions to North American Ichthyology, No. I. Review of Rafinesque's Memoirs on North American Fishes". (Bulletin United States National Museum, No. IX. 1877.)

Jordan, David S. "Report on the Fishes of Ohio." (Geological Survey of Ohio, Vol. IV, pp. 737–741. 1882.)

Jordan, David S. "Note on the Scientific Name of the Yellow Perch, The Striped Bass, and other North American Fishes." (Proceedings of the United States National Museum, Vol. VIII, pp. 72, 73. 1885.)

Jordan, David S. "Identification of the Species of Cyprinidæ and Catostomidæ, Described by Dr. Charles Girard, in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1856." (Proceedings of the United States National Museum, Vol. VIII, pp. 118–127. 1885.)

Jordan, David S. "A Sketch of Constantine Schmaltz Rafinesque". (*Popular Science Monthly*, Vol. XXIX, pp. 212–221. 1886. Same article reprinted in Science Sketches.)

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APPENDIX.

THE WILL OF RAFINESQUE.

The Will of Rafinesque.

(First Page)

THE last will and testament of Constantine Samuel Rafinesque of Philadelphia.

My own autograph Will written on the 1st May 1833 at the Eve of my departure for a journey in the Apalachian Mts of Carolina, Tenessee & Alabama.

1. I leave my immortal Soul to the Creator & preserver of the Universe, the Supreme Ruler of Millions of Worlds moving through space, to be sent to whatever world he may deem fit, according to his wise laws.

2. I wish my body if possible to be burnt rather than buried as I do not want to contamine the Earth by decay, nor be a cause of desease to other men. My ashes if they can be collected I wish to be deposited in a Urn, to be kept with my Collections.

3. The whole of my property is personal, and consist, chiefly in Scientific Collections, Books, Patents, Secrets and Claims. The whole of which except what shall be hereafter mentioned I leave to my beloved only Sister Gergette Louisa Rafinesque, now married to Paul Lanthois of Bordeaux in France, and to my beloved only Daughter Emily Louisa, to be equally divided between them, but at the conditions hereafter specified.

4. While residing in Sicily, I deemed myself lawfully married from 1809 to 1815 to Josephine Vaccaro, although the decres of the Council of Trent forbid our regular marriage. In 1811 was born my Daughter Emily, and in 1814 my son Charles Linneus, who died in 1815. But on hearing of my shipwreck in 1815, Josephine

suddenly married Giovanni Pizzarrone a Comedian, and dissipated the property I had left in her hands. She also refused to send me my Daughter, for whom I sent in 1816 & 1817 two Brigs in succession to Palermo, the Indian chief & the Intelligence. Wherefore I have ever since refused to notice her, and do not leave a single cent of my property to her, as she has another family by a living husband.

C. S. RAFINESQUE, my true will)

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5. Moreover as she lives at the expence of my daughter Emily, whom she has compelled to ascend the stage as a Singer, I direct that no part of my property shall be paid over to Emily, until she leaves altogether & separates from her unworthy mother, her share being kept in trust for her by my Sister the interest to be supplied for Emily own personal use only, until the death of her mother, when she may receive her share entire.

6. I order that my Library, Books, Maps, Engravings, Drawings, Collection of Shells, fossils, minerals, and other objects of Natural history, as well as my Herbals or Botanical Collections, besides my apparel, Drugs, medicines, Pulmel, Syrups, Balsams and every other personal property of mine (except my manuscripts and own drawings,) be sold at private sale in America or Europe by the Executors of my will, and the proceeds employed as follows.

7. To print and publish all my manuscripts, drawings, sketches and maps (unpublished at my decease) in the cheapest form either in America or Europe in English or french, unless the copyrights can be sold. These posthumous works of mine to be sold at an advance of 100 per cent, and 500 copies at least to be printed. The proceeds of the copy rights or sales are to form the fund of my inheritance, to be equally divided between my Sister and daughter.

8. I entrust the publication of these posthumous works, among which the principal are to be my 1. History of the American

Nations, 2. My travels and researches since 1800 3 Tellers or history of mankind, 4 Monuments of America. 5 Poem on Instability, & 6 My Autobiography &c, to my nephew Jules Rafinesque if he is able & willing, or else to Prof John Torrey of Newyork and Prof. Jacob Green of Philadelphia: directing them to publish in succession all what is suitable for publication, and I grant them as a reward One hundred copies of such works, or one fifth of the whole number published (being 50 each if two are employed in this task) or if the copyrights are sold by them I grant them ten per cent commission on the same for the trouble

(C. S. RAFINESQUE, my true will)

(Third Page)

of preparing them for the press.

9. The Secret of the Pulmel and other medicaments for the Consumption, I enjoin to my Executors not to divulge, but either sell it or pass it under seal into the hands of my Sister, to be by her used as her own, requesting her to give one fourth of the profits to my daughter Emily.

10. I direct my Executors to sell my patentright of the Divitial Invention if possible, and sue all the Bankers and Savings Banks who have stolen it in part or compromise it & pass the proceeds to my heirs as above stated.

11. I direct them also to sell all my Caveats & Secrets, relating to Aquatic Railways, Navigation of Shallow Waters, Steam Ploughs, Rail Wheels, Artificial Leather, Incombustible Architecture &c, and every other Invention of mine, the proceeds being disposed of as above.

12. I forgive all my foes and those who have stolen my property at various time, beginning with those who embezzled my father and uncle inheritance. But I direct my Executors to endeavour to collect all debts due to me, of which a list will found with vouchers.

13. If any body has thought himself wronged by me, I ask their pardon. I never did any thing wrong willingly, but being beset by knaves and Rivals may have been compelled to act sometimes in a way not exactly as I should have chosen, had I been fairly dealt with by others.

14. I do not owe any thing of any account, have lately dealt always in cash, there is no Bills against me, and any one presented would be spurious. There may be some old claims against me by my defunct brother Anthony, but it was unfounded as my Letters to him prove, and if his son Jules brings it on, he will hereby be unfit to be my publisher. Some old claims in Sicily and Newyork by Pinistri & Roulet, if brought forward must be compromised & much reduced, as my lawsuit with Pinistri evinces the shallowness & injustice of this claim, & Roulet accts are also mostly wrong, both besides are obsolete & out of law course. In justice they ought to take as offsetts the similar claims for $10,000 I have on Lafleche, Lanfiar, Blodget, Cramer & Spear, Thomas Smith, Trampylo Univry* & Botanic Garden &c, or at least accept my works in paymt of any real compromise balance.

C. S. RAFINESQUE my own will)

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15. I direct my Executors to withdraw, claim & publish my memoir on Materials for hist of America sent in 1825 to the Academy of Sciences of Boston for a premium of $100, both of which have been withheld & stolen from me, as the Letters of Mr. Everett proves. Also my memoir on a Peaceful Congress of Nations sent in 1831 to the Peace Society of Newyork for the premium of $500 offered & not yet awarded, if it is not the successful one and publish it with my other posthumous works.

*Transylvania University is evidently intended here. From this item it may be inferred that Rafinesque claimed an unpaid salary balance.

16. Whereas all the learned Societies of America directed by a base feeling of jealousy in some members have never valued nor encouraged my labors in Science, I leave them nothing, and direct to sell none of my collections to them unless a better price can not be obtained in Europe: where I recommend selling to public institutions rathan than private individuals.

17. The gold medal awarded me by the Soci of geography of Paris, I leave to my nephew Jules Rafinesque, at the condition to keep it forever in the family of Rafinesque as a honorable record of a reward of merit.

18. I leave to my neice Laura Rafinesque, a wedding present at her choice or a necklace of the value of one hundred francs to be paid to her on her wedding day, and leave her besides a set of all my works published or posthumous to be given her at once.

19. I request my sister (particularly if she has no children) to leave equaly at her death, all her share of my inheritance to Jules and Laura, or their children. If Emily should die before me, I leave her share to Jules Rafinesque, requesting him to allow something to Henrietta Whinston Daughter of my Emily by Sir Henry Whinston, whom I also recommend to the care of my Sister, if her father does not provide for her.

20. If my Sister dies before me, I leave her share to Jules & Laura Rafinesque to be equaly divided between them; but if they should at any time bring on against me or my Estate the unfounded claims of their defunct father, I withhold from them the whole, and all the beneficial clauses of this will in their favor, and substitute to them my Daughter Emily.

21. If the proceeds of my Estate, & posthumous works, patents and Inventions should exceed the sum of ten thousand Dollars or fifty thousand francs: I direct that the excess whatever it is, may be put at compound interest in a Savings Bank for the benefit of the first Female Orphan School

C. S. RAFINESQUE my own will)

(Fifth Page)

that shall be established in the United States, as near as possible upon the plan of Girard's Orphan College for Boys. And if none is established within ten years after my decease, I give the same excess to the first Free Library that shall be established in fire proof buildings in the United States.

22. I name as Executors of this my last Will and Testament, Prof: John Torrey of Newyork, Prof. Jacob Green of Philadelphia, Peter A. Browne Esq of Philadelphia, Dr. James Mease of Philadelphia J. H. McCulloh Jr. of Baltimore, and the Consul of France in Philadelphia for the time being, or any three of them that may accept the trust, if three should think fit to decline it.

23. I recommend the care, selection & publication of my manuscripts relating to travels and Botany to John Torrey chiefly; those on Zoology & Sciences chiefly to Jacob Green, those on Geology and onyctology chiefly to Peter A. Brown, and those on History, Antiquities & Languages chiefly to J. H. McCulloh.

24. I conclude by stating explicitly that I wish all the clauses of this Will, to be understood in their plainest obvious meaning and sense, without cavil nor quibble, but as equity and justice should decide and require.

Written, Done, Executed and sealed by myself, being in perfect health of body and mind. In witness whereof I have signed this at every page and at the end & propose to deposit the same at the public office for registering Wills In Philadelphia this first of May 1833.

{L. S.} C. S. RAFINESQUE

(this is my own autograp will)

Addition. I add Dr. James Mease of Philadelphia to my Executors & publishers of my works giving him the general superintend of it as I know his fitness for this task

Codicil. I vouch and aver that the claim of Maclure against me has been settled by me by my shipment of Plants &c.

2. That the claim of Atkinson is cancelled by my offsets, the mistakes in his previous accts & the withholding the 100 plates of the Medical flora worth $300, whereby he is largely in my Debt

3. that my claim on the Estate of Z. Collins is just and must be pursued & recovered by law or compromise

C. S. RAFINESQUE

SUPPLIMENT, ADDITION & CODICIL TO MY LAST WILL OF 1833

Whereas since the date of this Will I have had the misfortune to lose my Sister Georgette Louisa Lanthois born Rafinesque who was to have been my sole heir, I hereby confirm the whole of my said will except what relates to her, and I substitute for my heirs Jules Rafinesque my nephew son of my late brother Anthony Rafinesque, and Laura Rafinesque his sister and my niece, besides Emily Rafinesque my natural Daughter to be all all three my joint and absolute heirs, each in one third, of my estate, chattels, properties and claims

But whereas my nephew & niece Julius & Laura Rafinesque are minors, whatever will belong to them shall be held in trust by my Executors until they are of age, the interest alone being paid them till them. And whereas my Daughter Emily has been bereft from me and is in the power of rapacious relations (unless she should be married by this time) it is my will that only the interest of her share to my estate should be paid to her during her whole lifetime, and the principal should revert at her death to Julius & Laura Rafinesque. The Consul of the two Sicilies in Philadelphia can inform on Emily who is now in Naples. Julius & Laura are in Paris.

Whereas Mr. Peter Browne has neglected my business, I strike him off from the number of my

C. S. RAFINESQUE

(Second Page)

Executors and appoint in his stead my friend Dr. Samuel Betton of Germantown. Wherefore the three Executors of my will should be Dr. James Mease, Prof Jacob Green & Dr. Samuel Betton. But if one of them should decline to serve I substitute the french Consul for the time being, if another should decline I substitute the Consul of the two Sicilies for the time being, and if all three should decline, the third to be appointed by the Court.

I particularly confirm the obligations imposed upon the Executors of my will, to have my valuable Collections properly sold and rather in Europe than in America, where they will fetch a better price. I want them to be offered first to the Museum of Natural history of Paris at a fair mutual valuation and also the obligation to publish all my manuscripts, the works thereof forming part of my estate when printed like my other Works.

I recomend again to my nephew Jules the care of my manuscripts & works. If any msst of mine is neglected by my Executors, he may call for all what I have written in books & loose sheets, and may thereof draw what materials he may deem worthy of publication.

I aver that I owe not one cent to any body, having always paid cash for everything lately, but that many owe me largely, and that I have many claims to settle, whereof Schedules will be found in my Books, Pulmel Book, Natural Collections Book. Even my Sister or rather now her husband Paul Lanthois owes me a settlement of account for many articles Sent for Sale to them at Bordeaux & received.

C. S. RAFINESQUE

(Third Page.)

After ten years trials and delays, I succeeded this year to establish in May, the Divitial Institution of North America, and Six per cent Savings Bank, which is a beneficial & useful Institution. It has been assailed at the outset by the violent opposition

of the gambling Institutions trying to be set up who have bribed some of my friends & given me all the trouble they could.

My uneasiness of mind on that score has been great & hurtful to my health, finding I could find so few to act honestly to the public along with me. If I should die before I can put in full successful operation which requires one year, I leave it in the hands of the few friends who partake my honest meaning, my two joint trustees Peter Brutte & Christopher Marshall may admit another equally honest & carry on the Institution under the printed Rules & published regulations

I aver that the whole of my Expences to form & mature this Institution since 1825 has over Three hundred Dollars & my expences from March to June abt $60, besides the printing. These expences were to be paid me in shares & are yet to be. None but those that can show their certificates signed by me are entitled to them as paid, as the Letter p was put in the Books to some Np not paid.

The above is the last Codicil & Supplement to my will, in witness whereof I have written the whole myself and signed & sealed it, and mean to deposit it in the office of the Probate of Wills of Philadelphia

Philadelphia the 15th June 1835

C. S. RAFINESQUE

(Fourth Page)

Additional Codicil I further add and solemnly declare that the late award of $173 made in my favor by the Arbitrators in my claim on Collins' Estate is less than is justly due me, & if the Administrator appeals this claim must be pursued to the utmost and papers found to prove $306 and beyond I recommend compromise in all cases to my Executors in cases of disputed claims and to avoid litigation & expences.

29

Whatever in my will & in this Codicil may be found dubious must be construed according to the dictates of equity & honesty.

Done in Philadelphia the 16th June 1835

C. S. RAFINESQUE

CITY AND COUNTY OF PHILADA SS.
REGISTER'S OFFICE NOV. 16. 1840

Then personally appeared Samuel Hood & James Henry Horn & on their oaths did say that they were well acquainted with C. S. Rafinesque, deceased the Testator in the foregoing Will & three Codicils named in his life time & are acquainted with his handwriting having seen him write his name as well as other matters, that they have viewed the foregoing Will and Codicils and that as well the body thereof as the signatures C. S. Rafinesque thereto subscribed are all of the proper hand writing of him the said C. S. Rafinesque to the best of their knowledge and belief

Sworn and subscribed before me the date above.
I. B. SEWALL
Depy Register

SAM HOOD
JAMES HENRY HORN

NOVEMBER 28th, 1840.

I do swear that as the Executor of the foregoing Last Will and Testament and Codicils thereto of C. S. Rafinesque, deceased I will well and truly administer the Goods and Chattels, Rights and Credits of said deceased agreeably to law and that I will comply with the provisions of the law relating to Collateral Inheritance

Sworn and subscribed before me the date above and Letters Testamentary granted unto him.
I. B. SEWALL
Depy Register

JAMES MEASE

COMMONWEALTH OF PENNSYLVANIA,
CITY AND COUNTY OF PHILADELPHIA. } ss.

REGISTER'S OFFICE, September 13th 1894.

I, Wm. G. Shields, Register of Wills and ex-officio Clerk of the Orphans' Court for the City and County of Philadelphia, in the Commonwealth of Pennsylvania, do hereby certify the foregoing to be a true and accurate copy of the last Will and Testament and three Codicils thereto of C. S. Rafinesque, deceased, together with the probate thereof upon which Letters Testamentary were granted unto James Mease on the 28th day of November, A. D. 1840, as the same remains on file and of record in this office.

In Testimony Whereof, I have hereunto set my hand and official seal at Philadelphia the date above.

{ L. S. }

WM. G. SHIELDS
Register of Wills and ex-officio Clerk of Orphans' Court.

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